Challenges in prehospital emergency care

To my family

Örebro Studies in Caring Sciences 16

Kerstin Forslund

Challenges in prehospital emergency care

Patient, spouse and personnel perspectives

Title: Challenges in prehospital emergency care
– patient, spouse and personnel perspectives

Publisher: Universitetsbiblioteket 2007
www.oru.se

Editor: Maria Alsbjer
maria.alsbjer@pi.oru.se

Printer: Intellecta DocuSys, V Frölunda 10/2007

ISSN 1652-1153
ISBN 978-91-7668-554-9

Abstract

Kerstin Forslund (2007): Challenges in prehospital emergency care – patient, spouse and personnel perspectives. Örebro Studies in Caring Sciences 16. 75 pp.

Prehospital emergency care (PEC) with the emergency call to the Emergency Medical Dispatch (EMD) centre is an essential part of the health-care system. It is important to obtain knowledge about the links in the PEC chain from the perspectives of those providing the service and those receiving it. The overall aim of this thesis was to describe the challenges surrounding PEC based on the experiences of patients, spouses and personnel. A qualitative descriptive design was used in the five papers included. The data analysis methods were phenomenological-hermeneutics (I–III), qualitative content analysis (IV–V) and descriptive statistics (V).

Interviews with thirteen patients who had called the EMD-centre due to acute chest pain (I) revealed a general satisfaction with PEC. They were aware of the number to call in an emergency but were uncertain when to call. The potentially life threatening emergency situation was marked by vulnerability and dependency and was fraught with pain, fear and a sense of aloneness.

An overall theme of aloneness emerged from the interviews with nineteen spouses who had placed an emergency call for their husband or wife that was experiencing acute chest pain (II). The challenges in being a spouse to a person in need of PEC were associated with: "Being responsible and trying to preserve life" and "Being able to manage the uneasiness and feel trust in an uncertain situation". The spouses were in an escalating spiral of aloneness, worry, uncertainty, stress, fear of loss and desperation.

Interviews with sixteen emergency operators dealt with situations they considered difficult to deal with and their reflections on how they managed such situations (III). Uncertainty, communication difficulties and insufficient resources characterized those situations. Skills, knowledge, experience, as well as personal qualities such as sensitivity, self-insight, empathy and intuition were regarded as important when handling them.

Interviews with four nurses and fifteen emergency operators related to their experiences of working together for two years at an EMD-centre were conducted after the nurses were added to the EMD-centre to increase medical and nursing competence (IV). Initial frustration and scepticism changed to positive experiences with improved cooperation and service. The nurses voiced difficulties dealing with the more medically urgent calls and the emergency operators with the more complicated and diffuse medical cases.

A total of 336 questionnaires related to alarms involving acute chest pain and given the highest priority by the emergency operator were collected in a study aimed at describing the ambulance personnel's perceptions of the quality of the information received from the EMD-centre (V). The ambulance personnel perceived most of the information such as patient assessment, condition, history, preparedness and in particular pain status to be of high quality.

In summary: In PEC there is many interdependent complexities that present demands and challenges to the actors involved (I–V). In general those who received emergency assistance from PEC were satisfied, but the margins between success and failure are small. Risks for errors exist throughout the PEC chain and time poses a challenge. Understanding is crucial for all involved, and the same situation can be experienced differently. Challenges inherent in PEC are the communication problems, unpredictability and uniqueness along with daring to be in the acute situation and dealing with a sense of aloneness, uncertainty and dependency. The

personnel that do not have the ability to see the person they are helping are even more challenged. Important attributes for PEC personnel are caring attitudes, personal skills, experiences and professional knowledge. PEC personnel have the authority and power to act and make decisions, in which responsibility, sensitivity, and human dignity must be addressed. Lives are saved with PEC despite all the challenges and possibilities for error, such as those that exist between the different actors. It is vital that the PEC chain is as strong as possible.

Keywords: challenge, prehospital, emergency, care, patient, spouse, personnel, chain, acute chest pain.

ORIGINAL PAPERS

This doctoral thesis is based on the following five papers, which will be referred to in text by their Roman numerals.

I
Forslund K., Kihlgren M., Östman I., Sørlie V. (2005) Patients with acute chest pain – experiences of emergency calls and prehospital care. *Journal of Telemedicine and Telecare* 11(7), 361–367.

II
Forslund K., Quell R., Sørlie V. (2007) Acute chest pain – spouses' experiences of the alarm situation, emergency call and prehospital care (submitted).

III
Forslund K., Kihlgren A., Kihlgren M. (2004) Operators' experiences of emergency calls. *Journal of Telemedicine and Telecare* 10, 290–297.

IV
Forslund K., Kihlgren M., Sørlie V. (2006) Experiences of adding nurses to increase medical competence at an Emergency Medical Dispatch centre. *Accident and Emergency Nursing* 14, 230–236.

V
Forslund K., Gustafsson M., Sørlie V. (2007) Acute chest pain alarms – ambulance personnel's perceptions of the quality of the information received from the EMD-centre (submitted).

CONTENTS

INTRODUCTION

When people are stricken by an acute illness or accident and need an ambulance and professional medical help, they call the emergency number to reach the Emergency Medical Dispatch (EMD) centre. This situation can be experienced as being life-threatening for the affected person and a stressful and unpleasant situation for everyone present. A life could be at stake, so it is important that the Prehospital Emergency Care (PEC) functions and performs optimally. One caller to the EMD-centre recounted the situation in the following way:

> "*They assured me that the ambulance was on the way and I was instructed as what to do while waiting. It was horrible, and I was really scared I would die. I was worried the ambulance would not be able to find me if I fainted. Minutes felt like hours; I was lying there on the stairs, I remember it was in the middle of the night and it was pitch-black out, I wondered if they would ever come. I think I lost consciousness for a while, but then I heard their voices. They had found me after all. I was cared for and given help for my excruciating chest pain and I survived.*"

People in our society expect their emergency call to be answered and help to be administered promptly. From earlier experiences in emergency care, I heard patients or their relatives comment on how important the contact was with the emergency operator and the ambulance personnel. They were impressed by the emergency operator's ability to understand their problem and the ambulance personnel's skills and efficiency during what they experienced as chaos. While working in community nursing I became aware that problems could arise during the contacts with the PEC when an ambulance was needed for patients in primary care. The need for increased insight and knowledge in the emergency care given in the prehospital phase became all more obvious. PEC must be the best possible, as patients' lives hang in the balance.

BACKGROUND

Prehospital emergency care (PEC) chain

PEC involves the early-qualified first aid and treatment given on site or during transportation to the hospital due to accident or illness (Socialstyrelsen 1994, Mistowitch *et al.* 2004). The goal for PEC is to create the best possible circumstances that will prepare the patient and put them in as good condition as possible for the next part of the health-care chain (Jonasson & Wallman 1999, Bång 2002). It consists of medical treatment, emergency care and ambulance transportation of acutely ill or injured persons as well as rescue activities at the site of a disaster. The emergency calls to the EMD-centres are a part of PEC (Socialstyrelsen 2002). Emergency operators at the EMD-centre are to prioritise emergency medical calls after they have made assessments and come to a decision based on the health related and medical information they are given. Additionally, they should give advice to the caller and keep the ambulance personnel adequately informed (Socialstyrelsen 1997). For the persons calling, it is a situation with varying degrees of emotional stress and anxiety (Bång 2002). An overview of the events occurring in the different PEC locations is displayed in Table 1.

Table 1 The prehospital emergency care (PEC) chain

Prehospital Emergency Care- chain	At the location of the emergency	EMD-centre		Ambulance care		
Course of events	Emergency call made to the EMD-centre	Emergency call received	Information exchanged Emergency prioritized Ambulance dispatched	Alarm received from EMD-centre Ambulance departs	Arrives to patient Medical treatment and emergency care initiated	Transportation to the hospital
Actors	Persons calling: Patients, spouses or others	Emergency operators Registered nurses		Emergency medical technicians Registered nurses		

Prehospital emergency care historically

Development of the ambulance care and transportation system

One of the earliest descriptions of systematic prehospital management of illnesses or injuries originated during the French revolution. Baron Dominique Jean Larrey (1766-1842) developed a plan for the rapid evacuation of wounded soldiers from the battlefields using mobile medical units, which he called *ambulances volantes* (flying ambulances) (Wiklund 1987, Skandalakis *et al.* 2006). He instituted a system where the wounded soldiers were treated by trained medical personnel and transported to a field hospital all of which resulted in decreased morbidity and mortality rates. The wounded were treated according to the urgency and observed gravity of their injuries (Skandalakis *et al.* 2006).

The first Swedish motor-driven ambulance was introduced in Stockholm in 1910 (Wiklund 1987). Advances within military medical emergency services were made during the first and second world wars, but were not used in civilian settings until the 1950s (Pozner *et al.* 2004). The ambulances at that time were used for the transportation of the sick or injured to the hospital and were regulated by the fire brigades or the hospitals (Strömbäck & Kirk 1987, Wiklund 1987). Demands on the personnel at that time were physical strength, knowledge of how to take care of the vehicle and good driving skills (Jonasson & Wallman 1999). The developments within anaesthesiology during the 1950s gave rise to improved first aid. The introduction of cardio-pulmonary resuscitation (CPR) and intravenous treatments made it possible to give more effective first aid outside the hospital setting (Sefring & Weidringer 1991). "Care during the transportation not only transportation to care" was the new slogan (Wiklund 1987). The provision of medical treatment and emergency care in the ambulance was introduced in the 1960s (Suserud 1998).

Development of the alarm organisation

Alarm from the French word "á lárme" is a word used to warn for danger and the word could be associated with increased preparedness. Shouting, ringing bells or canon shots could historically mediate alarms in case of an emergency (Anderbring 1998). It was the rapid technological development during the 19th and 20th centuries with the important innovations of electricity, telegraph and telephone that changed society so greatly. These innovations also increased the possibilities to build more effective alarm

organisations. In the 1950s, Sweden was the first country to start a telephone system so that the same emergency call number could be used throughout the entire country (SOS Alarm 2007). In the 1970s it was decided to develop this further and the Emergency Medical Dispatch (EMD) organisation was founded that has centres located in each county that are co-ordinated with the ambulance organisation (Socialstyrelsen 1997).

Prehospital emergency care – current system and organisation

Most of the world's societies have a rescue organisation in case of emergencies. The goal of the Swedish health-care system is good health and good health care under equal conditions for everyone (SFS 1982:763, SOSFS 1993:17, Socialstyrelsen 2006). Included in this right to health-care, is emergency care. The county councils are responsible for the establishment of an efficient ambulance organisation (SFS 1982:763 §6). Expectations and requirements placed on this organisation by the communities include high quality health assistance in case of an emergency. The way in which PEC systems are organised differs throughout the world (Pozner *et al.* 2004, Sikka & Markolis 2005, MacFarlane *et al.* 2005, Black & Davies 2005, Timerman *et al.* 2006, Tanigawa & Tanaka 2006) and even within the Nordic countries (Langhelle *et al.* 2004). The design of PEC systems takes into account the interrelated events that combine to offer the best care possible to patients outside the hospital (Spaite *et al.* 1995, Sikka & Markolis 2005). Accessibility is important and a general goal in Sweden is that 80 % of the population should be able to be reached within 8 minutes after the call has been received and 95 % within 15 minutes (Langhelle *et al.* 2004). PEC can be affected by the centralisation and specialisation of the health-care system and with the closing of smaller emergency care units; transportation times will be increased (Jonasson & Wallman 1999).

Emergency Medical Dispatch centres

SOS Alarm is a publicly owned company that has managed the Emergency Medical Dispatch centres in Sweden since 1973. During the last few decades technical advances and equipment development at the EMD-centres has been rapid. In the beginning, Swedish citizens could call for help by dialling 90 000. This number was changed to 112, a number that is to be used jointly by all of the countries in the European Union (EU). By dialling 112 is it possible to receive help from a number of available rescue

services, e.g. ambulance, police, fire, air and sea rescue and ski patrol (SOS Alarm 2007). There are 18 EMD-centres in the country, all of which are open 24 hours a day, 365 days a year. In total there are approximately 600 emergency operators employed at the centres. To qualify, the emergency operators must complete a one-year theoretical and practical education course provided by the company that focuses on communication techniques and usage of the technical equipment. They must also pass an annual test that evaluates their ability to work under stress. In the larger cities there are physicians and registered nurses (RNs) that work in association with the EMD-centres (SOS Alarm 2007).

The emergency calls

In case of emergencies, the call to the EMD-centre is the first link in the PEC chain. The emergency operators' tasks are to determine the nature of the caller's problem, respond to it and send the appropriate rescue team. They can provide instructions and counselling over the telephone (Clawson & Sinclair 2001, Wahlberg 2007) such as how to give CPR, control bleeding, open blocked airways and other life saving techniques (Mistowitch *et al.* 2004). To do their job the emergency operators must ask pertinent questions and interpret the answers in the best way possible. To do so they have at their disposal a medical index to use as a guide (Socialstyrelsen 2002, Zenit 2006). The contact with the caller is brief and a first action is often taken after a few seconds. During the exchange of information, communication with the caller can be complicated (Bång 2002, Karlsten & Elowsson 2004). The EMD personnel's assessments and prioritisations are an integral part of the care given to patients prior to their arrival at the hospital (Socialstyrelsen 2002). Annually the EMD-centres receive about 20 million emergency calls, of these 3.8 million are for medical problems (SOS Alarm 2007).

Ambulance care

Ambulance care has evolved from what was mainly just the transportation of the sick or injured to the hospital, to the performance of advanced emergency care and medical treatment in addition to the transport (Suserud 1998). Daily work for the ambulance personnel can range from advanced lifesaving PEC to less complicated care and transportation of patients (Jonsson 2004). The ambulance personnel need to quickly

assess the patient's condition in order to promptly decide on the necessary measures that need to be taken. Within PEC it is important to be flexible and adaptable in regards to the patients' medical condition while also being flexible and adaptable with fellow colleagues and other professional groups (Wireklint-Sundström 2005). The emergency operator's information is the starting point of each case and the information may not be complete (Mistowitch *et al.* 2004). Those working in ambulance services must be prepared to be unprepared to some extent (Wireklint-Sundström 2005). There is always something unknown which is hard to be prepared for. It is a mentally demanding task and posttraumatic stress can occur (Jonsson *et al.* 2003, van der Ploeg & Kleber 2003). Emergency care interventions have become increasingly important and specialized procedures can be done on site or during transportation to the hospital. Demands for medical and nursing qualifications for the ambulance personnel have been increased during the last few years and since 2005 at least one member in the ambulance team must be an RN (SOSFS 1999:17, SOSFS 2000:1, SOSFS 2001:17). About 4,000 persons are employed as ambulance personnel, and the numbers of RNs in this group are increasing due to the demands for increased emergency medical and nursing competence (Socialstyrelsen 2004). Between 900,000 and 1 million ambulances are dispatched annually in Sweden (SOS Alarm 2005, Wahlberg 2004).

Prehospital communication and prioritisation

Communication

Communication problems with the caller to the EMD-centre can lead to an incorrect assessment and prioritisation as well as to misunderstandings (Socialstyrelsen 2002). Human communication in general, is a complex phenomenon (Nilsson & Waldemarsson 1994, Eide & Eide 1997). The Latin word *Communicatio* is defined as doing something together, a reciprocal process of sharing thoughts, feelings and attitudes. Communication is behaviour that involves physical and mental activity and the sending and receiving of messages. Communication is also a process where information is exchanged by using language, signs or gestures, as it can be both verbal and non-verbal (Nationalencyklopedin 2000). According to Travelbee (1971) communication is an essential part of health-care; it is a key tool through which the caregiver-patient relationship is established. Care giving is a dynamic process between the caregiver and the patient that can involve the actors directly or indirectly. Care

giving situations are experienced in time and space, they are fluid and in continuous motion. Change occurs in every situation and this movement and activity is a result of interaction and communication. When individuals are experiencing ill health, a change is needed in order for them to achieve a better health status (Travelbee 1971). Travelbee (1971) writes, "Nursing is, in a sense, a service which is initiated for the express purpose of effecting a change in the recipient of the service". For the PEC personnel this service can imply lifesaving activities. Communication takes place in every encounter between the patient and the health-care personnel. The caregiver must be able to understand the patient's communication and use this information as a basis for care and medical interventions. Verbal and non-verbal communication can yield misunderstandings and emotional reactions (Eide & Eide 1997). Non-verbal signals such as breathing, sighing or coughing are important clues in the interpretation of the communication. Second hand information complicates interpretation and understanding (Wahlberg 2007).

The communication between all actors in the prehospital phase of the health-care system is very important for those involved, since lives are at stake and the situations are often stressful. The emergency operators are often confronted with and have the responsibility to handle the difficult situations, where time is crucial and decisions and prioritisations must be made rapidly. Giving advice and instructions by telephone can be a demanding task (Wahlberg 2004). The emergency operators carry out their tasks based on their interpretation and understanding of the situation (Bång 2002). Communication, caring and first aid skills based on professional knowledge are needed by the emergency operators in order to understand the seriousness of every caller's situation, and react with speed when they make decisions, assign prioritisations and handle the cases. Communication problems among the professionals can also lead to misunderstandings in such areas as the transfer process, which can have negative consequences for the ill, or injured (Manias & Street 2000, Thakore & Morrison 2001).

Prioritisation

Governmental decisions delineate the framework for the PEC system and organisation in each country, and the economy can set the limits. Events such as terrorist threats or epidemics can increase international cooperation, like that which can be generated within the European Union (Gouvras 2004). Prioritisations and economical issues are important in all parts of the health-care system and PEC is no exception. Prioritisations involve making a choice and doing what is considered to be the most important first, even when the choice comes at someone else's expense (SOU 1995). The concept can also imply the preference of one thing over another (Eide & Eide 1997). Prioritisation is not a new issue in our health-care system. Choices have been made between patient groups and available treatments as long as medicine and health-care has been practiced. Prioritisation methods vary according to time and place (Ryynänen *et al.* 1999). One concept that has been used in association with the prioritising and sorting of patients in PEC and emergency department settings, is triage (Göransson *et al.* 2005). Making professionally based prioritisations in PEC is an essential task, and in Sweden basically three priority levels are used:

- **Priority I** Presence of acute life threatening conditions or injuries.
- **Priority II** Acute or urgent symptoms that are not life threatening.
- **Priority III** Medical transportation or ambulance matters that can wait, such as the transportation of patients between hospitals (Socialstyrelsen 2002, SOS Alarm 2007).

A fourth prioritisation has also been mentioned, which assumes care or treatment is not needed under transportation and can be provided by e.g. a taxi (Socialstyrelsen 2002). About 25 % of the ambulance transportations are priority 1, 25 % priority II and 50 % are priority III. Of the acute priority I ambulance transportations, about 25 % are due to accidents and 75 % to illness. The most common types of illnesses are acute chest pain, dyspnoea, unconsciousness and epilepsy attacks (Socialstyrelsen 1998, Bång 2002). For the personnel, making prioritisations requires professional knowledge, judgement and discernment and can be a very difficult and unpleasant task (Eide & Eide 1997). The emergency operators' assessments and prioritisations of the emergency

calls as well as their decision-making plays a crucial role in the preparedness of the ambulance personnel as they paint a verbal "picture" of the situation (Pettinari & Jessopp 2001).

First PEC contacts with acute chest pain emergencies

Acute chest pain is one of the most common causes for calls made to the EMD-centres in an medical emergency. The symptoms can escalate into life-threatening conditions and is a common cause of death outside the hospital (Herlitz & Holmberg 2004). Trauma, acute chest pain or other heart problems are the most common causes for assigning the highest priority to alarms and alerting the ambulance (Hjälte 2005). Of the alarms given the highest priority, about 20-25 % are due to cardiac problems (Shuster *et al.*1995, Hjälte 2005). Acute chest pain symptoms occur for the most part among older adults that often have multiple illnesses, which can make the symptoms difficult to interpret and the cases more complicated (Melby & Ryan 2005). With an aging population the PEC personnel will treat a larger number of older adults that are presumably more ill (McConnel & Wilson 1998). More people with severe illnesses are cared for in their homes or at nursing homes and can require PEC when acute life threatening symptoms arise (Melby & Ryan 2005). People can wait hours after the onset of the symptoms before they seek help and these delays can increase the risks for sequelae (Quinn 2005, Okhravi 2002). Early identification of myocardial infarction followed by rapid diagnosis and medical treatment can improve the prognosis for patients (Johnston *et al.* 2006, Herlitz *et al.* 2002).

In case of chest pain emergencies, the patients themselves can be the ones that make the call to the EMD-centre, especially if they are alone. The caller can also be the spouse or someone else witnessing the emergency situation, if the patient is unable to make the call. The patient's symptoms can be typical or atypical and it may be hard to interpret the warning signs (Barnhart *et al.* 2005). Situations that necessitate contact with the EMD-centre are often perceived as life threatening (Bång 2002). In some emergency situations there comes a point when there is no other choice than to call for help, and when they do call, the nature of the emergency is presented to an unknown person (Ladd 1985). The first direct physical contact the patients have with the PEC personnel is when the ambulance arrives.

Caring demands in PEC

The encounters between those in need of PEC and the PEC personnel are short. It is a fast paced activity in many aspects different from other health-care activities. Even though PEC involves emergency situations, the need for caring still exists. According to Martinsen (1993a) we are always in some sort of a situation, be it one common to our daily lives or one marked by its' uniqueness. Situations are fluid and as such can remain somewhat still or become more flowing and changeable. Our personal experiences influence our actions and reactions in each situation. Another theoretical assertion held by Martinsen (1993a) is that people are innately dependent upon others and relationships with them. In emergency situations especially when an acute illness strikes, a person becomes more dependent upon others for their survival, which can influence how they act and react. The patient or the caller to the EMD-centre has to rely on the emergency operator as well as the ambulance personnel who are unknown to them (Ladd 1985). In general, the PEC personnel must also rely on an unknown person to supply them with information on the symptoms and medical status of the sick or injured in need of help. The Norwegian RN and philosopher Martinsen (1993a, 1993b) proposes in her philosophy of caring that; caring is fundamental, and *caring involves relational, practical and moral aspe*cts. Care is based on the relationship between the person who gives care and the person who receives it. Our experiences are developed in the cooperation we have with others and a person can learn how to care through practical experiences and concrete situations (Martinsen 1993a, 2000). Martinsen's theory is not centred on how human beings relate to each other on an individual basis, but rather on how human beings relate to each other as a whole. An important principle is the way we are responsible for the weak and vulnerable. In the practical aspect, caring is learned through concrete practical actions and practice. The moral aspect of caring concerns decisions about a persons needs and abilities, and these matters should not be over or under-estimated. The moral aspect is present in concrete situations when we decide on how to help another person in the best way possible (Martinsen 1993a). As health-care professionals this involves putting yourself in the situation and making a choice and a decision based on your understanding of the situation, professional knowledge and caring skills (Martinsen 1993a). A person is always in a particular situation and a particular space (Martinsen 2006), this can be especially so when persons are involved in PEC situations. Martinsen (2006) writes

that in each particular space there is time, ambience and power, which together set the tone and colour of the situation. Health-care activities take place in a room that is shared by the patients, their relatives and the caregivers together. In PEC, this room is the ambulance or the often short telephone conversation that takes place during the emergency call.

RATIONALE FOR THE STUDY

The emergency call to an EMD-centre is often a person's first contact with the health-care system in case of acute illness or injury. Prehospital emergency care (PEC) including the emergency call to the Emergency Medical Dispatch (EMD) centre is an essential part of the health-care system in our society. The seriousness of the situation can be hard to interpret for the prehospital personnel, patients or spouses. There is a risk for mistakes, misunderstandings and communication problems among the actors involved in the acute often time sensitive situations that can have life threatening consequences and repercussions. Since lives may be at stake, it is crucial that this part of the health-care chain functions optimally. Literature on this topic often pertains to response times, morbidity and mortality rates. Studies concerning the perceptions of the different actors involved in PEC are relatively few. It seems important to increase knowledge and insight into the experiences of persons involved in PEC from the perspectives of those providing the service and those receiving it. With an even better understanding of the challenges involved, improvements can be achieved in the health-care services provided and how they are utilised.

AIMS

The overall aim of this thesis was to describe the challenges surrounding prehospital emergency care based on the experiences of patients, spouses and personnel.

To answer this, the following specific aims were addressed in five different papers.

Paper I To illuminate how patients with acute chest pain experience the emergency call and their prehospital care.

Paper II To illuminate how spouses experience emergency calls and prehospital care with acute chest pain alarms.

Paper III To analyse the situations that emergency operators experience as difficult to deal with and their reflections on how they managed them.

Paper IV To describe, nurses' and emergency operators' experiences of adding nurses to increase medical and nursing competence at an EMD-centre.

Paper V To describe emergency ambulance personnel's perceptions regarding the quality of the information received from the EMD-centre with acute chest pain alarms.

MATERIAL AND METHODS

Design

This thesis concerns experiences from different actors in the PEC chain. An overview of the five papers is presented in Table 2.

Table 2 Overview of the five papers presented in this thesis

Paper	Design	Participants	Data collection	Data analysis
I	Descriptive Qualitative	13 patients that had called the emergency number due to acute chest pain	Interview study	Phenomenological-hermeneutic approach
II	Descriptive Qualitative	19 spouses that had made the emergency call due to their partners acute chest pain	Interview study	Phenomenological-hermeneutic approach
III	Descriptive Qualitative	16 emergency operators that worked at an EMD-centre	Interview study	Phenomenological-hermeneutic approach
IV	Descriptive Qualitative	4 RNs and 15 emergency operators that worked together at an EMD-centre	Interview study	Latent content analysis
V	Descriptive Qualitative	336 questionnaires from 100 on duty ambulance personnel that had responded to chest pain alarms	Questionnaire	Manifest content analysis Descriptive statistics

Qualitative approaches were used to capture experiences from patients who had called the EMD-centre due to acute chest pain (I), spouses that had made the emergency call due to their partners chest pains (II), emergency operators that had worked at an EMD-centre (III, IV) and registered nurses (RNs) and emergency operators that had worked together at an EMD-centre (IV). A combination of a qualitative method and

descriptive statistics were used to obtain knowledge from ambulance personnel that had responded to acute chest pain alarms (V).

Setting

The study that papers I-V concerned took place in a Swedish county with about 275,000 inhabitants that are served by three hospitals, one of which is a university hospital. The EMD-centre in this area receives approximately 700,000 calls annually from persons requesting help or emergency assistance from PEC personnel, police, fire brigade and other rescue teams. Approximately 130,000 of these are medical emergencies for which 35,000 require the dispatch of an ambulance. The ambulance services are provided by the county council, which employs about 100 ambulance personnel to work at the 9 ambulance stations in the county that has their three main stations located at the hospitals (SOS Alarm 2005). At the EMD-centre there are 15-16 emergency operators employed and during a two-year period there were also four RNs. The four RNs worked part time mainly on the day shift and did not work night shifts or on the weekends.

Participants

The participants have had involvement with PEC as a patient, a spouse or member of the personnel (Table 3).

Paper 1, Patients

The participants in paper I consisted of patients who called the EMD-centre and had their chest pain emergency given the highest priority (Table 3). The 13 patients interviewed in this study resulted from the selection of every 5th questionnaire that had been collected in paper (V) involving ambulance personnel where the patients had made the call themselves. They were 3 females and 10 males, aged 52-90 years (mean 67) that lived in both rural and urban areas. When the emergency call was made, 9 were alone and 4 had a spouse present.

Table 3 Overview of the prehospital emergency care chain and papers I-V in this thesis

Prehospital Emergency Care (PEC) chain	At the location of the emergency	EMD-centre		Ambulance care		
Course of events	Emergency call made to the EMD-centre	Emergency call received	Information exchanged Emergency prioritised Ambulance dispatched	Alarm received from EMD-centre Ambulance departs	Arrives to patient Medical treatment initiated	Transportation to hospital
Actors	Person calling Patient or Spouse	Emergency operators Registered nurses		Emergency medical technicians Registered nurses		
Papers in this thesis I-V						
Paper **I** Patients	→	→	→	→	→	→
Paper **II** Spouses	→	→	→	→	→	→
Paper **III** Emergency operators		→	→			
Paper **IV** Emergency operators Registered nurses		→	→			
Paper **V** Ambulance personnel				→	→	→

Paper II, Spouses

The participants were 13 wives and six husbands whose emergency call to the EMD-centre due to their spouses' chest pains was given the highest priority. These interviews also resulted from the selection of every 5th questionnaire collected in paper (V) but from those where the spouse made the call. They resided in both urban and rural areas and their ages were estimated to be ranging between 50 to 85 years.

Paper III, Emergency operators

All 16 emergency operators, 10 female and six male, at the EMD-centre agreed to participate. They were all certified emergency operators and none had any formal medical education. They ranged in age from 34 to 56 years (mean 43) and had an average of 15 years (range 6-22) experience as an emergency operator.

Paper IV, Emergency operators and registered nurses

The participants in this study were the same emergency operators as in paper III, except for one female who was on leave, plus four female RNs employed at the EMD-centre for two years with the purpose of increasing medical and nursing competence. The emergency operators had worked at the EMD-centre an average of 17 years and their ages ranged between 39 to 58 years (mean 45). The RNs had on average seven years experience that included emergency department or ambulance care and were between 26 and 41 years old (mean 34).

Paper V, Ambulance personnel

All of the approximately 100 ambulance personnel employed at the different stations in the county were asked to participate and complete a questionnaire after they had responded to acute chest pain alarms that were given the highest priority over selected periods of time. The ambulance personnel had an emergency medical technician (EMT), assistant nurse or RN (10-20 %) education.

Data collection

Interviews

Individual interviews were carried out in papers I-IV since the intention was to capture the participants' experiences from events in their lives (Lorensen 1998). The questions were open-ended, which encouraged the participants to speak freely and they were not interrupted (Mishler 1986). Follow up questions were then used to deepen, clarify or develop the responses (Mishler 1986). The interviews were tape-recorded and transcribed verbatim.

The patients in paper I were interviewed ten days to three months after they had made the emergency call depending on their medical status. The interviewees decided where and when the interview should take place, some chose the hospital but most chose their homes. They were asked to tell their experiences of the emergency call and the prehospital care. The interviews were tape-recorded and lasted 5-35 minutes.

In paper II interviews were conducted with spouses who had made the call to the EMD-centre for their partner. This was done after the patients had given their permission to contact their spouse for an eventual interview and one to three weeks after the emergency call and the prehospital contact had been made. Most of the

interviews were held in the interviewees' homes, as was their choice. They were asked to tell about their experiences of being a spouse to someone with acute chest pain, of making the emergency call, their participation in the alarm situation and the prehospital care. These interviews were also tape-recorded and lasted 10-30 minutes.

The interviews with emergency operators in paper III were carried out in a separate room at the EMD-centre, over a period of two weeks. The interviews lasted for 45-90 minutes (mean 60). All interviews were tape-recorded except one, when the participant preferred the use of written notes.

In paper IV individual interviews were conducted with the 15 emergency operators working at the EMD-centre and the four RNs who had worked there for two years. The interviews took place in a separate room and lasted 25-60 minutes (mean 40). One participant again preferred the use of written notes.

Questionnaire

A questionnaire was developed for paper V as no suitable questionnaire was found in the literature. It was based on literature, the authors' and ambulance supervisors' experiences and as requested by the supervisors was limited to one page. Background data requested in the questionnaire included: the date and time the alarm was dispatched, patient identification number that is based on their date of birth and the caller's relationship to the patient (Table 10). The questionnaire addressed how the ambulance personnel experienced the quality of the information received from the EMD-centre through "yes" or "no" answers and an open comment section. Four hundred questionnaires were distributed over the entire county and were collected from boxes placed at the ambulance stations or the emergency departments. The ambulance personnel who cared for the patient in the ambulance were asked to complete one questionnaire per case after the patients were admitted to the emergency departments. Out of the 345 questionnaires collected, nine were excluded because they lacked an assessment of quality. This left a total of 336 questionnaires that were included for analysis.

Data analysis

Phenomenological-hermeneutic approach

A qualitative approach was used for the analysis, which can be useful when the lived experience of a phenomenon is of interest (Creswell 2007). The transcribed interviews in papers I-III were analysed using a phenomenological-hermeneutic approach inspired by Ricouer (1976). This method was developed at the University of Tromsø, Norway and Umeå University, Sweden (Udén *et al.* 1992, Lindseth *et al.* 1994) and is described in a separate paper (Lindseth & Norberg 2004). Several researchers have used this method previously (Söderberg *et al.* 1996, Sørlie *et al.* 2000, Frid *et al.* 2001, Torjuul 2006). The phenomenological-hermeneutic approach is based on the assumption that it is possible to grasp the meaning of lived experiences through an interpretation of the subjects' narratives while the aim of the researcher is to understand meanings of phenomena in their life world. Additionally this approach assumes that more than one interpretation of the text can be made, as only one single truth is impossible to find. Possible and probable meaning is searched for and you can argue for or against the interpretation (Ricouer 1976). The interpretation involves a dialectic movement between the parts of the text and the whole text, a movement between explanation and understanding. The phenomenological-hermeneutic approach consists of three phases: the naive reading, the structural analysis, and the comprehensive understanding/ interpreted whole (Lindseth & Norberg 2004).

The naive reading of the interviews in papers I-III was an initial interpretation of the text as a whole that directed the next phase of the analysis. In the structural analyses (I-III) a detailed analysis was performed with a purpose of explaining the parts of the text and whether the structure validates or invalidates the first ideas obtained in the previous phase. This was a detailed analysis, 'meaning unit' for 'meaning unit', with the purpose of explaining the meaning of the text. A 'meaning unit' is a part of a sentence, a whole sentence or a paragraph that is related by content. The meaning units were condensed, abstracted and organized into sub-themes and themes (I-III). In paper III two structural analyses were conducted due to the nature of the aim. The interpreted whole is a comprehensive understanding supported by the first two phases. The meaning of the text evolved from a dialectic movement between the authors' pre-understanding, the whole and the parts of the text. This understanding

was re-contextualized by using relevant literature to widen and deepen the understanding of the text (Lindseth & Norberg 2004, Ricouer 1976).

Qualitative content analysis

A qualitative approach can be useful when the responses are rich with nuances (Malterud 1998). Qualitative content analysis facilitates a systematic categorization and description of different data from verbal, visual or written text (Graneheim & Lundman 2004). This form of analysis is often used in nursing research and focuses on concerns, meanings, context, consequences or intentions in order to describe or delimit categories (Graneheim & Lundman 2004). Other authors researching PEC or medical telephone consultation have previously used this approach (Wahlberg *et al.* 2005, Jones & Machen 2003, Melby 2000). The interpretation of the written text can range from a concrete to an abstract level, from a manifest to a latent level and the interpretation can vary in depth and level of abstraction (Graneheim & Lundman 2004). After reading the interviews (IV) and written comments (V) several times, the text was divided into meaning units according to the aims. These meaning units, which can be words, phrases or sentences were then condensed and labelled with a code and sorted into sub-categories, categories and/or themes based on content similarities or differences.

In paper IV the interview text from the two personnel groups was analysed separately and a latent qualitative content analysis was performed. Latent content analysis deals with the more underlying meaning of the text, what it talks about and the analysis focuses on how different aspects of the text are related to each other (Graneheim & Lundman 2004). Different main categories developed from the groups (IV). From those, the categories were formed, two from each group with the same headings and one theme that covered both groups.

In paper V the authors used a combination of qualitative content analysis and descriptive statistics, which was determined to be the most appropriate. According to Creswell (2003) the approach used should be that which is most relevant to the aim and does not have to be limited to only one analysis form. The written comments made in relation to the assessment of the quality of the information received were analysed using manifest content analysis. Manifest content analysis is an analysis that deals with the substance of the text and what the text says which can later be used to quantify the

data (Graneheim & Lundman 2004). Out of the 336 questionnaires, 313 had written comments related to why they rated the quality of the information in the way they did. The questionnaires sometimes contained multiple written comments that when analysed together revealed a total of 398 meaning units.

Descriptive statistics

In paper V, the findings from the questions and the manifest content analysis of the written comments in the questionnaire were used as input for the statistical computations. Frequency tables and percent distributions were used to statistically describe the frequencies of different perceptions that explained the assessment of quality.

Ethical considerations

At the EMD-centre and elsewhere in the health-care system, privacy has the utmost priority for all persons involved. The Regional Research Ethical Committee (191/99 §24) approved the studies used for papers I-V included in this thesis. Participation was voluntary and consent was given after both verbal and written information was provided. The participants were informed that they could terminate their participation at any time without having to give a reason.

The patients with acute chest pain in Paper I were interviewed ten days to three months after they had made the emergency call depending on their medical status. The patients were contacted tactfully and with great respect especially since they had experienced a potentially life threatening situation. The patients decided where and when the interview should take place and the researchers used consideration regarding the patients' medical condition and willingness to participate. Since the patients were interviewed about their experiences that could have had strong emotional meaning and could be distressful to talk about, they were offered an opportunity to contact the interviewer after the interviews to discuss any subsequent reflections.

In paper II, spouses were interviewed one to three weeks after they had made the emergency call concerning their husband or wife only after the patient had given permission for the interviews. As in paper I, the interviewees were also given a possibility for post interview discussion if desired. Confidentiality was guaranteed in papers I-IV and the participants were assured that it would be impossible to determine

the identity of the persons linked to the data or findings. In Paper V confidentiality was also guaranteed but with the background data from the questionnaires that included the patient's identification number, and the date and time it was possible for the researchers to identify the actual alarm. The ambulance supervisors had verbally informed all personnel about the study and written information was also provided. The ambulance personnel answered the questionnaires after the patient had been taken care of at the emergency departments. Since the ambulance personnel could feel especially uncomfortable when the patient had died before reaching the hospital and with respect to them, the patient and the spouses, the ambulance personnel were told to disregard the questionnaire in such cases. The data in this thesis have been treated with confidentiality and shielded from all unauthorised persons not involved in the research. No individual can be identified in the final reports.

FINDINGS

The papers describe challenges inherent in being a caller in an alarm situation who then receives help from the PEC system (I-II) and from PEC personnel who give help (III-V). The findings are described out of the different actors' perspectives.

Paper I, Patients' perspectives of the alarm situation

Dealing with vulnerability and dependency

From the interviews with patients who experienced acute chest pain and have called the EMD-centre themselves, the two themes identified were *Vulnerability* and *Dependency* (Table 4).

Table 4 Patients' experiences of PEC following acute chest pain emergencies, the sub-themes and themes developed from the structural analysis

Sub-themes	Themes
Experience of:	
Pain	*Vulnerability*
Fear	
Aloneness	
Uncertainty	
Need of:	
Availability	*Dependency*
Help	
Care	
Treatment	

Dealing with vulnerability and uncertainty in a potentially life-threatening situation

For the patients experiencing acute chest pain, the emergency call they made was a lifeline in an exceptional situation, one in which they feared for their lives. Hesitation, uncertainty and doubts could precede the decision to call; one explanation given was that they did not want to burden the health-care system unnecessarily. The findings revealed that the patients were sure of what number to call in an emergency, but less sure of *when* to call it. The patients expressed a feeling of aloneness in the acute situation, even those who were not physically alone. The patients were in severe pain, but in spite of that, they hesitated to call until the pain became nearly unbearable even if they knew the delay could put their lives at risk. They even contacted relatives or friends to confirm their decision to call, since they did not want to be alone in their

decision. They became afraid when they thought that no one would find them if they lost consciousness, and realized that the possibility they might lose control over the situation was imminent. Experiences from similar situations could increase their sense of vulnerability, as they knew their life was at stake and this caused even more stress and anxiety. Their sense of time was obscured; time seemed to stand still while waiting for help, minutes felt like hours. If they sensed indecision or hesitation on the part of the PEC personnel during their communication with them, uncertainty developed that could increase their fear and feelings of vulnerability.

Depending on care and being understood and confirmed

The patients generally took for granted that someone would answer their call for help, and could complain that it took too long for the emergency operator to answer and to understand the urgency. They were dependent upon the emergency operator understanding their plight from their description of the symptoms. The patients were afraid they might not be believed or they would be rejected. They were also dependent upon the ambulance personnel for help, care and treatment. When the ambulance arrived they felt relieved, as it was difficult to manage the situation alone. The ambulance personnel took over the responsibility and started the medical and nursing treatment, and the feeling of aloneness and anxiety decreased. The patients were grateful that their lives had been saved and the quality of the brief contacts with the PEC personnel played an important role in their perceptions of what they determined to be proper care and treatment.

Paper II, Spouses' perspectives on the alarm situation

Daring to deal with the situation and an ability to take action

From the interviews with spouses to persons with acute chest pain one main-theme *Aloneness* and two themes *Responsibility* and *Uneasiness* emerged (Table 5).

Table 5 Spouses' experiences of PEC, the sub-themes, themes and main-theme developed from the structural analysis

Sub-themes	Themes	Main-theme
Daring to see the seriousness of the situation and do something about it Trying to understand and be understood Daring to be the helpful coordinator Daring to rely on yourself and on others	*Responsibility*	*Aloneness*
Dealing with uncertainty and worry Dealing with the frightening situation Dealing with frustration Dealing with the after-effects	*Uneasiness*	*Aloneness*

Daring to be in the situation and act as coordinator

It was sometimes hard for the spouses to understand and dare to see the seriousness of the acute situation, which made them uncertain as to how to act. The spouses expressed their feelings of how it could be difficult to be understood, to describe the situation and to get instructions while talking to the emergency operator. The spouses had to be the coordinator of the whole situation; that in addition to being the caller, had to find out what to do, give their partners support, manage any surrounding practical problems and guide the ambulance. The spouses alone had to manage all these activities. The spouses were sometimes hesitant about their decision to call and wondered if the situation truly warranted calling the EMD-centre for an ambulance. They felt it was easy to make mistakes while being stressed and wanted to avoid calling unnecessarily. This hesitation caused delays for medical treatment, in some cases for hours. The uncertainty that arose when making decisions caused ambivalent feelings of doing right or wrong and feelings of aloneness when acting on the decision. When they perceived their partners' lives were at risk, the spouses experienced worry, uncertainty, stress, fear of loss, feelings of aloneness and desperation. They felt forced to act to preserve life, a situation that required an ability to act. The spouses gave their interpretation of the situation, conveyed their observations and relayed second hand information regarding their partner's medical status, which needed to be understood immediately.

Managing responsibility, uneasiness and a sense of aloneness

Being responsible was challenging as was daring to do what had to be done to preserve life. Trying to remain as calm as possible was important in order to manage to give support to their ill partner. The spouses that had been through similar experiences were reminded of earlier incidents and were aware of what could happen if not that time, some time in the future. They felt alone when having those thoughts and they did not always want to talk about them. The worst outcome was something they needed to be prepared for, but realised it would be difficult to manage emotionally. For some spouses it was the first time they had called the EMD-centre in an emergency, for others it was an experience they had gone through many times before, which helped them to be more prepared. Previous experience they felt helped them to rely on their ability to handle the situation. The spouses felt uncertain when their partner's condition deteriorated rapidly, the symptoms occurred suddenly or were difficult to interpret. To manage the frightening situation, physical and psychological separation was one strategy used by the spouses. When it was hard to interpret the situation they waited to see if the symptoms would subside. Frustration occurred when they felt the emergency operator questioned what they said, and as their frustration increased they tried to pull themselves together to answer the questions or do what they were instructed to do. Frustrations were also felt when the spouses did not understand what the PEC personnel said or did, or when they felt too much time was elapsing. After their partners had been taken care of by the ambulance personnel the spouses could feel exhausted and just wanted to be alone for a while, some needed to cry in private and found it difficult to relax. Being able to manage the uneasiness, stress and strain and to feel trust in the uncertain situation was not easy even for the experienced spouse. Afterwards a sense of relief was felt, but they always feared bad news would await them some day.

Paper III, Emergency operators' perspective of working in PEC

Having to rely on personal qualities, professional capabilities and information from callers

Based on the interviews with the emergency operators there were three themes identified from the situations they found difficult to deal with: *Uncertainty*, *Communication difficulties* and *Internal and external resources* (Table 6). *Personal qualities* and *Acquired skills* were the two themes that were identified as important in the management of these difficult situations (Table 7).

Table 6 Emergency operators' experiences of situations they found difficult to deal with, the sub-themes and themes developed from the structural analysis

Sub-themes	Themes
Diffuse symptoms Lack of information Uncertain circumstances	*Uncertainty*
Communication handicaps Professional communication-jargon Foreign languages	*Communication difficulties*
Self-identification with the situation Children involved Limited resources	*Internal and external resources*

Table 7 Emergency operators' experiences of what was important in the management of difficult situations, the sub-themes and themes developed from the structural analysis

Sub-themes	Themes
Individual traits and personality Intuition and the power of insight	*Personal qualities*
Knowledge Experience Active listening	*Acquired skills*

Trying to understand is crucial when lives are at stake

The situations the emergency operators experienced as difficult to deal with were both ordinary and dramatic and a common denominator in these situations was the great amount of energy needed to manage them. A strategy the emergency operators used to deal with the difficult calls was to make every attempt to understand the caller and put themselves on their same "wavelength". They felt alone in the situation and it was a challenge to try to get callers that were giving unclear or insufficient information to elaborate to a point they could be understood. It was an even greater challenge when they had to deal with uncertainties or communication problems. The emergency operators needed to "collect themselves" between the calls, and not bring negative feelings into a new call. They worked under great pressure, and misunderstandings or incorrect decisions could have serious consequences. Situations that the emergency operators experienced as difficult to deal with were when uncertainties occurred due to diffuse symptoms, a lack of information or other circumstances which complicated the case. Foreign languages, communication handicaps or unfamiliar professional medical terminology or jargon could cause communication difficulties. As they were using themselves as a "working-tool" they felt strained when their inner resources were put on trial, such as when they identified themselves with the situation, when children were acutely ill or injured, or when accessibility to ambulance resources was limited.

Using qualities and capabilities effectively in fast-paced complex situations

The emergency operators' management of difficult situations was interpreted as trying to stay calm and collected in a dynamic process that shifted between the less dramatic and the chaotic. This process often takes place under stressful circumstances with very little time. They tried to understand the difficult situations, to prioritise their actions and make their decisions to the best of their ability. The emergency operators stated that they needed more guidance, feedback, and education in their work. To manage these difficult situations, special skills, knowledge and experience were regarded as important. In addition, personal qualities, such as; sensitivity, empathy, and intuition were vital in order to handle difficulties. The emergency operators' tasks are complex as well as intricate and they need to be; flexible, compassionate and efficient when making decisions. The emergency operators also felt that their challenging working

tasks require a responsible attitude, the ability to cope with stress, patience, and a wide range of personal and professional knowledge.

Paper IV, Emergency operators' and nurses' perspectives of working within PEC

Finding the possibilities in and overcoming the difficulties of teamwork

The aim was to describe emergency operators' and RNs' experiences of working together at an EMD-centre two years after the RNs had been added to the team to increase medical and nursing competence. Even teamwork could be a challenge when decisions about the changes in work were coming from 'above'. From interviews with RNs and emergency operators' one theme "*Complementing each other"* and two categories "*Competence at a higher level"* and *"Cooperation at stake"* were identified and pertained to both the emergency operators and the RNs (Table 8-9).

Emergency operators dealing with their feelings of being in question

When the RNs were introduced to the team at the EMD-centre, the emergency operators with their many years of experience found the new work organisation challenging and said it felt like they were 'pushed off balance' and they became sceptical of the situation. They felt their competence was being questioned and they were uncertain as to how their positions at work would be affected. The scepticism they felt in the beginning subsided and eventually changed to acceptance and appreciation. The cooperation that developed was appreciated as it led to increased emergency competence and knowledge e.g. increased medical and nursing care skills. It also increased their sense of confidence and they gained different new experiences.

Table 8 Emergency operators' experiences of working at the EMD-centre after the addition of RNs, the sub-categories, categories and theme developed from the content analysis

Sub-categories	Categories	Theme
Increased medical skills Increased confidence Different experiences	*Competence at a higher level*	*Complementing each other*
Scepticism	*Cooperation at stake*	

Table 9 RNs experiences of working with emergency operators at the EMD-centre, the sub-categories, categories and theme

Sub-categories	Categories	Theme
Being of real use **New experiences**	***Competence at a higher level***	***Complementing each other***
Frustration	***Cooperation at stake***	

RNs dealing with a new work situation and form of nursing

The RNs also felt challenged with their new roles and new work place. They were surprised that they were perceived as being a threat to the emergency operators' positions. Not being able to physically meet the person they were supposed to help was challenging, as was the short time in which they were to handle the acute emergency situations. Uncertainties and the level of difficulty could increase when the RNs did not have the possibility to speak directly with the sick or injured person. They expressed that they lacked tele-care training in their education and felt that years of experience as an RN before working at the EMD-centre was not only beneficial but necessary. According to them, both work and life experiences seemed to be important. The RNs' initial frustration turned to a feeling of being of real use and with their work together with the emergency operators they gained new and valuable experiences.

Finding ways to utilize each other's knowledge and competence

Initial frustration and scepticism changed to more positive experiences that resulted in improved cooperation and service. The RNs expressed difficulties dealing with the most urgent acute calls, as it was a challenge when they could not see the person they were to help. The emergency operators on the other hand expressed difficulties with the more complicated, somewhat diffuse cases such as stomach problems. The RNs were more accustomed to handling such cases and it was easier for them to interpret the symptoms. Through their complementary abilities and cooperation, the two groups could work well together to help those in need in an emergency to feel more safe and secure.

Paper V, Ambulance personnel's perspectives of emergency calls

Being dependent upon and having to rely on the information given

For the emergency operators it was a challenge to convey the best possible information to the ambulance personnel, and for the ambulance personnel it can be challenging to be dependent upon and have to rely on the information from the emergency operators. The information given is a prerequisite for the ambulance personnel's ability to understand the acute situation and be prepared for whatever actions they may need to take. In this study, the most common caller to the EMD-centre due to acute chest pain alarms was a next of kin, such as the spouse who conveyed their second hand information and observations about the patient's condition to the emergency operator (Table 10).

Table 10 Callers to the EMD-centre by frequency (n=336)

Callers	Frequency n (%)
Next of kin	174 (52)
Health-care professional	83 (25)
The patient	72 (21)
Unknown	7 (2)
Total	336 (100)

Dealing with information of not high quality in the best way possible

Characteristics in the written comments associated with high and not high quality information received from the EMD-centre were indicative of the complex situations that the patients with acute chest pain as well as the ambulance personnel found themselves in. High quality information was associated with relevant assessments and prioritisations, as was receiving sufficient information about the patient's condition and history. That the patient was informed and prepared seemed important as it had a bearing on the speed and accuracy in which the case could be processed (Table 11).

Table 11 Ambulance personnel's perceptions associated with high quality information received from the EMD-centre, the frequency within the categories (n=240)

Categories associated with high quality information	Frequency of perceptions n (%)
Relevant assessment and adequate prioritisation	139 (58)
Information about previous illnesses or disabilities	42 (18)
Patient informed and prepared	32 (13)
Information related to duration and degree of pain	22 (9)
Speedy handling of the case	5 (2)
Total	240 (100)

Table 12 Ambulance personnel's perceptions associated with information not of high quality received from the EMD-centre, the frequency within the categories (n=158)

Categories associated with information not of high quality	Frequency of perceptions n (%)
Deficient assessment and inadequate prioritisation	57 (36)
Uncertain information	36 (23)
Patient not informed and prepared	30 (19)
Deficient information related to pain	26 (16)
Deficient information about the patients medical condition	9 (6)
Total	158 (100)

Deficiencies in the assessment, communication and the processing of the cases were categories associated with information that was not of high quality (Table 12). To be able to sufficiently grasp the situation and procure, the necessary information from the caller during the emergency call so that as much high quality information as possible could be relayed to the ambulance personnel, was found to be a challenge. Unfortunately not all information can be of high quality in these complex situations. The ambulance personnel need to deal with the challenges that develop when less than high quality information is relayed to them.

REFLECTIONS ON FINDINGS

Maintaining an intact chain

To describe the challenges surrounding PEC based on the experiences of the different actors involved (I-V) was the aim of this thesis. For the PEC personnel as well as the persons seeking emergency help for themselves or others due to acute chest pain, this is a challenging experience since lives are at stake. Providing care (III-V), being cared for as a patient (I) or, being in the acute situation as a spouse (II) in the PEC chain entails situations often filled with uncertainties (I-V), fear and anxiety (I-II). PEC is provided via telephone (III-IV), in private homes or in public places (V), which implies being in and working in uncertain circumstances. Acute situations are time sensitive and are fragile in that small errors can have profound consequences. The risk of not understanding or not being understood is ever present in the encounters between the persons in need of emergency help and the PEC personnel (I-V). Misunderstandings are obviously something to be avoided as much as possible, but unfortunately they do happen. The acute situations can be pervaded with feelings of having faith in the system or distrusting it (I-II).

The demands on the PEC personnel are great when they need to solve every case in the best possible way, in every circumstance and under all conditions. Their job entails a great deal of responsibility and they have the authority and power to act (III-V). Mistakes or misunderstandings and lack of knowledge on how to handle the situations can compromise patient health and safety as well as lead to incident reports (III-IV). Most inhabitants understand the serious nature of calling the emergency number; especially older adults, who perhaps have too much reverence for it and therefore hesitate to use it (I-IV). On the other hand hoax calls pose problems for the EMD-centres and they can increase feelings of uncertainty for the personnel (III-IV). PEC is a vulnerable link in the health-care chain and this vulnerability can in itself lead to or cause weaknesses. The problems that can occur in the PEC contacts are however offset by the possibilities for positive outcomes. PEC and the persons working in it save many lives. That the health-care system and in particular the PEC chain functions as it should is something inhabitants in our society not only expect but take for granted. Each link in the health-care chain needs to be firmly connected with the next since a break in it can have serious consequences.

Challenges in the PEC chain

Being dependent upon each other

The PEC chain needs to work optimally since people's lives are at stake. In the PEC chain, persons in need of acute help are dependent upon the PEC personnel to safely, securely and efficiently assist and prepare them for the in-hospital phase of their health care and eventual recovery. The PEC chain that this thesis refers to begins with the caller (I-II). The EMD personnel (III-IV) respond to the caller. They are responsible for deciding the appropriate prioritisation and for passing on adequate information to the ambulance personnel (V) who then administer emergency care and medical treatment, and transfer the patient to the hospital. In the next segment of the health-care chain, the emergency department personnel based on the condition of the patient and the information received decide on further care and treatment for the patient (Bruce & Suserud 2005). Each personnel group within PEC makes up their own part of the chain. They work in and are responsible for one link and are dependent upon the others. Together, they have responsibilities and must meet the demands necessary to carry the person in need of help through the PEC chain. Since each PEC personnel group is working as one link of the PEC chain and that no chain is stronger than its weakest part, the weakest part could occur in the connection between two links. It is in these connections that the challenges could appear, and if they fail and the chain breaks, the person in need of help is put at risk.

It seems that the phenomenon of dependency is central in the PEC system. The PEC personnel are dependent upon each other in the different parts of the PEC chain and in a similar manner the patients or spouses are dependent upon the PEC personnel for help. The PEC personnel are there to give help in life-threatening situations and the demands in these situations are not only to be a good professional helper but also to perform this task in a good moral manner. Martinsen (2006) emphasises this in her philosophy about interdependency, which gives a moral aspect to the relationships among people and to life. The patient or callers are dependent upon the PEC personnel who have the authority to make decisions and the power to act, a task that requires time, professional knowledge and great humility. Martinsen

(1989) writes that the person receiving care is always in a situation of dependency. This dependency has implications on the PEC caregivers' responsibilities and duties.

The perception of time

For the caller, spouse or patient, time seemed to stand still while waiting for help to arrive, for the PEC personnel time flies by quickly. PEC is a time sensitive activity, but for the patients (I) and spouses (II) interviewed, their sense of time was obscured. For them the seconds they waited for the emergency operator to answer the call felt like minutes, and the minutes they waited for the ambulance to arrive felt like hours. Davis (2005) writes that time has an impact on patients' health care expectations. People categorise time as being in the past, present and future. They identify it as being measured time or lived time depending upon their present perspective. The experience of time is individual and can be experienced objectively in exact time, or subjectively as qualitative time or 'internal' phenomenological time (Kristensson-Uggla 1994). The patients (I) or spouses (II) cognitively understood that the ambulance would be there shortly, but the experience of waiting was prolonged and intensified by their or their spouses' serious illness. Even though time is of an essence the PEC personnel (III-V) must take time to understand the patient's problem and decide on the action (Shattell *et al.* 2006). Due to the patients' serious situations and the need for rapid assessments, decision-making and rescue, time was experienced as being precious and too limited. Time was a challenge for the different actors in PEC (I-V).

Individual experiences influencing the PEC situation

The emergency operators had many years of experience in their profession and expressed the importance of experience when handling difficult cases (III). The patients (I) and the spouses (II) have also had individual experiences that influenced their understanding and perception of the emergency situation. Experience is a huge concept within the different scientific realms. According to the philosopher Gadamer (2002) experience is a concept that has been the subject of little research. Experience is described as being a process such as participation in an event. Experience can be something we have. It can be something we do, like when we understand a concept and by doing so, our intellectual horizon is widened. An experience is valid as long as it is confirmed and as long it is not offset by a new experience. A person cannot have the

exact same experience more than once (Gadamer 2002). Usually the same event can be experienced or perceived differently by two persons (Polit & Beck 2004). Experiences are events that convey meaning and can also be defined as significant situations from which you can learn. New knowledge is developed through experiences. Experience gives knowledge of what something is about, it gives insight, and self-insight is a higher level of knowledge. A person with experience is not synonymous with someone who knows more and better than others, but is someone that has self-insight and is open for new experiences (Gadamer 2002). According to Travelbee (1971) caring situations are dynamic processes between the personnel and the patient. The caring situations are experiences or happenings in time and space that have the purpose of achieving a change in the patient.

The patients, spouses and all the actors involved in the PEC situation have unique individual experiences as human beings and as professionals. Acute chest pain alarms are often a matter of routine for the PEC personnel since they have experienced them many times before. For the patients or their spouses it can never be a matter of routine they said, even if they had previous similar experiences. Understanding the patient's needs is essential for helping them. Shattell and colleagues (2006) write, "Without an accurate appreciation of the patients' experience of the problem, it is difficult to meet their health care needs." Active listening is important in PEC (III) as elsewhere in the health-care system. Listening is important for understanding. "A person can listen without caring, but can't care without listening" (Shattell *et al.* 2006). It is important to give the person you meet your full attention since this attention can be helpful in understanding the other person's experiences (Martinsen 1993b, Olsen & Helland-Finstad 2003). It is reasonable to assume that this attention and self-insight is crucial for the emergency operators when they are delivering a service to those in need of acute help. This service is produced and consumed at the same time. For the PEC personnel it is of importance that they are open for new experiences in order to meet the demands placed upon them from those in need. The emergency operators past experiences can be of consequence when making decisions in emergency situations (cf. Cioffi 2001). Experiences that are challenging can be emotionally disturbing, and can also lead to personal growth that involves self awareness and an ability to understand another person's situation. Trying to understand the lived world of others is another aspect of nursing practice and care, which is just as important as the skilled technical

aspects of care (Arbon 2004). Even if the PEC personnel (III-IV) have had long experience in working within the prehospital field, each day can bring with it new challenges and uncertainties.

Uncertainty, communication problems and unpredictability

Weaknesses in the chain could cause feelings of uncertainty both among the persons in need of help (I-II) and among the PEC personnel (III-V). To call for an ambulance in an emergency is for most people a major decision (Ahl *et al.* 2006) and there are barriers that can exist (Morgans *et al.* 2005). The emergency call may have been preceded by uncertainty and hesitation in the instances the caller did not want to call unnecessarily (I-II). The patients (I) that called in an emergency were in a potentially life-threatening situation and felt there was little other choice than to call for help. The PEC personnel might not be aware of the situation leading to the turning point when a person decides to call the EMD-centre or for how long they have hesitated to do so. Ahl and co-workers (2006) concluded in their study that professionals need to be mindful of both the patient's medical needs as well as their reactions to the experience of being in a threatening situation.

When the patients were afraid of being rejected (I), they searched confirmation for their decisions to call by contacting relatives or friends. These delays or hesitations can lead to complications, increased health-care costs and a worsened prognosis for recovery. In some interviews mostly with older adults (I), it was stated that they hesitated to call because they did not want to be a burden to the health-care system. According to Kaur and co-workers (2006) there are many factors influencing the decision to call such as the interpretation of the symptoms, the family situation, cultural beliefs and coping strategies. Delays in seeking treatment may be a result of previous experiences with the health-care system, since according to Martinsen (1993a) situations are interpreted individually. Moser and colleagues (2005) reported that there was no difference between men and women in the amount of time they delayed calling, but there was a gender difference in the reasons for the delays and in the pattern of the decision-making. Schoenberg and co-workers (2003) reported that negative encounters with health-care providers could be a reason for why women with cardiac symptoms delayed seeking help and eventual treatment. This is in line with Travelbee (1971) who writes that earlier negative experiences, denial and defence mechanisms can play a role

in delays. Illnesses that pose a threat to the individual can influence how that individual person reacts. Each person is unique and acts in his own individual way. The PEC personnel (III-V) must deal with these acute situations made worse by delay. Information campaigns or patient education can help prevent such happenings (Ingarfield *et al.* 2005).

In general, the patients and spouses that had met the challenges associated with acute chest pain felt satisfied with their PEC experience. The hesitation and delay that occurred with the call for help put the patient at risk. Spouses (II) were the most common caller in acute chest pain situations (V) and in many cases they had called multiple times without hesitating. It is reasonable to assume that with favourable past experience; positive contact and good advice from the PEC personnel there will be less hesitation and delay in these situations and therefore an improved chance for a good outcome. This is in accordance with Sørlie and co-authors (1996) that reported improved satisfaction with health-care when family members received professional advice and counselling in acute illness situations. The challenge associated with hesitations and subsequent delays could be reduced and satisfaction with the health-care system increased with good professional advice throughout the PEC chain. On the other hand, uncertainties can also lead to over utilization of PEC services. This was apparent in the cases where the spouses after their partner had been treated and discharged from the emergency department questioned if they had made the correct decision in calling for an ambulance. The spouses and the EMD-personnel made their decisions given the information they possessed at the time, and it is a well-known fact that it is easier to understand events afterwards.

For the professionals there are a number of overlapping factors that can contribute to feelings of uncertainty and according to Williams & Sibbald (1999) these are; uncertainty in relation to ones professional identity, working in a risk filled environment, experiencing uncertainty in relation to a patient's changing status, and uncertainty in relation to new roles. These uncertainties are in accordance with findings presented in papers III-IV. French (2006) wrote that uncertainty in a workgroup could be known and accepted, hidden or unrecognised. The presence of the RNs at the EMD-centre led the emergency operators to feel pushed off balance and elicited a feeling of uncertainty in the early stages of their work together (IV). Health-care is a complex activity (Leonard *et al.* 2004) and PEC is an important part of the whole health-care

system. Due to this complexity; misunderstanding, communication failures, or incorrect decision-making can result. Effective teamwork and communication can help prevent such happenings and therefore unfavourable consequences.

PEC personnel have to work with and manage multiple sometimes somewhat uncertain and unpredictable circumstances. For example, Wireklint-Sundström (2005) writes that ambulance personnel are paradoxically prepared, and at the same time unprepared, they are in other words prepared for the unprepared. The challenges associated with unpredictability can lead to both positive as well as negative experiences. Positive experiences arise from stimulation and excitement that comes from a job with variation but if these challenges are experienced as too demanding they can easily become negative (cf. Wireklint-Sundström 2005).

Another source of uncertainties in PEC is the implementation and use of the new high technological developments. Disputing opinions regarding the benefits of new technology can lead to professional uncertainty (Wichowski 1994), which was reported among the emergency operators in paper III. New technologies that are introduced without sufficient information and education can be difficult to use and appreciate, and thereby be the source of uncertainties among the emergency operators or other PEC personnel. New technology leads to new techniques, which then must be adapted for use in health-care (Barnard & Sandelowski 2001). The technology could be seen as both a challenge and an uncertainty. Advanced technologies are useless if competent people in praxis cannot use them (Tjora 2000). It is reasonable to assume that uncertainties arising in PEC can result from insufficient information or education relative to the level of responsibility that is to be assumed. The emergency operators (III) in their interviews mentioned how more education, guidance and feedback would be beneficial.

Communication problems can occur and complicate the case when the caller has problems defining the symptoms or there is something else that leads to miscommunication and misunderstandings (Cooke & Wilson 1998, cf. Farmer *et al.* 2006). Communication failures are a common cause for the occurrence of inadvertent patient harm (Leonard *et al.* 2004) and the emergency operators reported on the risks associated with communication in their work (III). A failure in communication can cause a break in the PEC chain that can lead to increased uncertainties and have serious consequences for persons in need of help. Good effective communication and

cooperation between the different professionals in PEC can decrease feelings of uncertainty. Uncertainty was identified in paper IV when the RNs and emergency operators began to work together. In the beginning they felt frustration and scepticism and the emergency operators felt they were being put in question. As communication and the level of cooperation increased, they learned different skills from each other, gained new insights, experiences and knowledge, and they also realised how they complemented each other so that together they strengthened their link in the PEC chain.

Uncertainty is not an unambiguous concept. Uncertainty prevails in human existence, and can be described as the state a person is in when they have a goal but do not know how to achieve it. With uncertainty the individual is unable to determine the expected course, progression or comparative efficacy of the options in the actual situation (Penrod 2001). Uncertainty can occur when a person is unable to recognise and categorise stimuli and this can result in an inability to get a clear notion of the situation. Situations appraised as uncertain can get the person to mobilize resources in order to adapt (Polit & Beck 2004). In a state of uncertainty a person exists in the present and is unable to perceive the future as a reality (Penrod 2001). John Dewey an American philosopher wrote that situations are uncertain because they are "transitions to and possibilities of later experiences" (Dewey 1980). For the callers it was a challenge to manage the uncertain situation and even though they were sure of what number to call, they were not always sure of when to call it since they were uncertain of how serious their symptoms were (I-II). Uncertainty was identified in all of the papers (I-V). There is always the risk that PEC personnel will encounter uncertain situations where it is difficult to know what to do. This problem of uncertainty is applicable to everyone since as humans we know there is nothing that is certain in life (Sørlie *et al.* 2000).

Managing aloneness

Being in the acute situation meant not only managing the situation but having the ability to act. For the patients (I) or spouses (II) it was an experience where dealing with worry, uncertainty and responsibility was a reality, it was a situation of vulnerability and dependency. They needed help and they needed it from PEC (I-II). In papers I-IV in this thesis the actors recounted a sense of aloneness during the alarm

situation in some way or another. To some degree everyone has been alone or experienced loneliness, it is universal and is a part of being human (Killeen 1998). Closely related concepts to aloneness are loneliness, social isolation and solitude (Killeen 1998). Loneliness is a psychological experience, and it has been described as occurring when there is a discrepancy between the desired state of a persons relationships and their actual one. When a person feels lonely they long for companionship often for a particular person. Someone that is alone may be lonely but not necessarily so. The concept aloneness indicates being apart from anything or anyone and you can experience a sense of aloneness even when among other people (Killeen 1998). A dichotomous description of the essence of aloneness was presented by Wilkinson & Pierce (1997) to be a movement between vulnerability/self-reliance, fear/hope, helplessness/resourcefulness, a loss of self-control/self-determination and identity confusion/self-reflection. It is likely that persons involved in an emergency situation (I-IV) also experience the same sort of movement between these feelings. It is reasonable to assume that the patients (I) and spouses (II) that were experiencing a potentially life threatening situation were hovering between such feelings.

It happened that patients (I) were alone when they called the EMD-centre or felt they were alone even if they were not. The feelings of aloneness may have appeared when they realized their life was at risk and were unsure the help they needed would find them in time. Even if the patients were not alone, communication between couples could be lacking. When discordance exists couples may not share their feelings with each other (Svedlund & Danielsson 2004). Lack of information or when the partners withhold information about their symptoms (Svedlund & Axelsson 2000) can make it hard for the spouse to arrive at a decision about when to call the EMD-centre (II).

As the number of older adults increases and more of their care is given in their homes (Melby & Ryan 2005), the possibility they will require help when they are alone also increases. This feeling of aloneness can increase their fear and feeling of insecurity. With more severe illnesses being cared for in private homes, there will be a need for more PEC services in order to respond to an increased number of acute potentially life threatening symptoms (Melby & Ryan 2005). These circumstances can affect PEC since the cases can be more complicated and the symptoms more difficult to discern. Aloneness was felt by the spouses (II) when they alone decided what to do

when their partner was acutely ill; they alone had to be the one to take responsibility for the call. Eriksson & Svedlund (2006) wrote that chronic illness is considered an "intruder" in peoples' life. According to Eriksson & Svedlund (2006) emotional aloneness could be experienced by the spouses of partners with a long history of heart problems even though they were living together.

The PEC personnel (III-IV) also had feelings of aloneness while performing their duties at work. They felt aloneness while making decisions in difficult cases and acting on them. Challenges in the caring culture at the working place can cause feelings of aloneness. If it is not an open climate with the possibility for dialogue, feelings of aloneness among the personnel can appear, e.g. not being able to discuss what was found to be a difficult experience (Sørlie *et al.* 2003). It is reasonable to assume that in the beginning of the cooperation between emergency operators and RNs (IV) when feelings of frustration and scepticism occurred, feelings of aloneness were present.

Meeting the demands and the interdependent complexities

"When a care provider crosses the threshold of a patient's door, he or she crosses a border, moving from the world of practical preparation into that of a healing relationship in which everything he or she does is in the service to the patient. This border crossing brings care providers into the patient's and family's world - a world about which they know little - and within which they must tread with great humility" (Felgen 2004). The ambulance personnel cross the patients' threshold when they come to rescue them and the emergency operators cross their threshold when they enter the call. For the EMD personnel it can be difficult to prioritise a call. They base their decision on their perception of what has been communicated to them by the caller, their knowledge about symptoms and differential diagnoses, their experiences, and their ability to understand the situation. In order to meet the demands and challenges in the often complex situations encountered while working by telephone at the EMD-centre, it is necessary to try to understand the caller. Martinsen (2006) writes that perceiving and understanding are separate but not independent of each other. "We perceive and understand at the same time, and we understand on the conditions of perception."

Knowledge and information regarding possible or real weaknesses, or disturbances in the PEC chain can prevent unwanted consequences. It is

understandable that the person calling will have trouble communicating clearly and the big challenge is to successfully grasp the situation so that a reasonable decision can be made. Problems occurring between the other links of the PEC chain are a challenge but they can be easier to manage. One method is to have the different personnel groups act more as a chain and not just as individual links. It is important to think beyond individual professional territories and consider the entire picture and pathway that the patients must follow. Those in need of help have expectations that someone will come to their rescue and that they will receive good quality care. PEC is characterized by its rapid pace. Perhaps it is not the quantity of time the emergency operators and ambulance personnel spend with the patient that is important, but more so the quality. Uncertainties have to be handled in the best way possible, and the PEC personnel need to see the person as an individual and treat them with dignity, humility and sensitivity when managing the complex situations. A theoretical model can be used to examine and discover possible weaknesses in the PEC chain and thereby make it easier to do something about them.

A theoretical model to illuminate PEC

As a caregiver in PEC or elsewhere in the health-care system it is a challenge to give the best care possible. The organisation, the economic issues or the political decisions can infer possibilities or limitations. These limitations can also be due to the personnel working in the organisation or problems in the working environment. It is important to make the best out of the available resources. According to Martinsen (2006) care is provided in different settings, it is practical and involves concrete actions and situations. Caring can be understood from the ontologically concrete, practical or the organisational level. Knowledge and wisdom are developed during practice through our experiences. Our senses are important for our perceptions and experiences. Martinsen (2000) describes sight as the most dominant sense, one that gives mankind a general overview and an idea of the whole picture. Hearing is less dominant and together with the other senses helps human beings understand situations. In the prehospital phase the encounter between the person in need of help and the caregiver is short. The emergency operator cannot see the person they are supposed to help and have only their sense of hearing to rely on, the ambulance personnel on the other hand can in principle use all of their senses. We are always in a situation or in a particular

space (Martinsen 2006) especially in PEC. The tone of the situation has an effect on the ambience and how it is perceived (Martinsen 2006).

To illuminate the complex situations for the patients (I), spouses (II) and personnel in PEC (III-V), a theoretical model inspired by FAMM (The Five Aspects Meal Model) can be useful as a pedagogic tool and to facilitate practical work (Gustafsson 2004, Gustafsson *et al.* 2006, Forslund *et al.* 2005, 2007) (Figure 1). The theory of the American philosopher J. Dewey was the basis for this model, which has the aim to integrate both practical and theoretical knowledge (Gustafsson 2004, Gustafsson *et al.* 2006). It has been modified to illuminate PEC and the care given in the prehospital phase of the health-care system of which *The Room, The Meeting, The Interventions, The Atmosphere* and *The PEC system* aspects are included (Forslund *et al.* 2005, 2007).

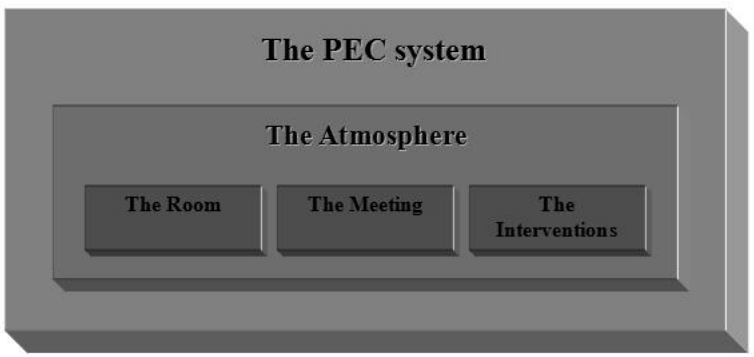

Figure 1 Theoretical model for PEC practice and education inspired by FAMM

The Room

PEC takes place in a room or setting. It can be in the ambulance, a public arena when the ambulance team cares for an injured person at the scene of an accident or when they care for a person with acute chest pain in their home (V) (Mistowitch *et al.* 2004). There is also the virtual room, the short communication the callers (I-II) have with the personnel at the EMD-centre (III-IV) by phone. When the room is the ambulance, the ambulance personnel are in a familiar working milieu doing what they are trained to do (V). The patient and spouses involved in this situation are in an unfamiliar milieu and experiencing something new and often frightening (I-II). In the ambulance the

patients or their spouses are aware of the environment and their senses are involved and they can remember the situation well (I-II). For the PEC personnel it is a challenge to provide the best possible care in the room they work in even though many uncertain factors are involved. If the person is uncomfortable and ill at ease in the room they will be less satisfied with the experience and perhaps even dissatisfied.

The Meeting

The health-care system is built on meetings between those who need help and those who can provide help, as well as meetings between the many professional groups (Åhlund 1996). The PEC phase is relatively short and the patients are in a vulnerable and dependent position (I) making the interaction between patient (I) and PEC personnel and interaction among the professionals (III-V) rather important to the outcome. It is a brief interpersonal encounter and the PEC personnel must care for the patient's needs under uncertain circumstances (III-V). During the emergency call it is important that the caller is understood within a few seconds (I-II). The patients need to be understood and confirmed and their problems be taken seriously (Nyström 2003) and the way they are met can be crucial to their experience (I-II). The patients and the spouses are dependent on the PEC personnel (I-II) and are in a situation where there is a risk for errors especially when uncertainties can be involved (I-V) (Thompson & Dowding 2001, French 2006). For the patients it can be experienced as a caring or uncaring encounter (Wiman & Wikblad 2004). Meetings that are based on dignity, respect and a caring attitude will have a better level of communication. A good meeting between the different actors will increase satisfaction.

The Interventions

Patients expect an optimal combination of medical and caring interventions that are based on theoretical as well as practical knowledge when their health is at stake. It happens that highly technical PEC with accompanying advanced medical interventions are administered under uncertain and stressful circumstances (I-V). In a possible acute myocardial infarction emergency for example, the PEC intervention is the life saving care and treatment given (I) (cf. Johansson *et al.* 2004). CPR, ECG tests, administration of pain relieving medications and other nursing procedures are possible interventions. At the EMD-centre the PEC intervention is the emergency call and all

that it entails; a service that is given and received at the same time (I-IV). There is a risk that mistakes can be made in these situations (I-IV). The PEC intervention and the quality of it can be life saving (I-V). The right intervention in a timely manner requires an optimally working PEC system. Uncertainties are obstacles that can lead to incorrect interventions that put patient safety and lives at stake.

The Atmosphere

The aspect of atmosphere plays a central role in the care and it can influence the holistic perceptions and is of great importance for those in need of acute help as well as for the PEC personnel. The atmosphere of the prehospital setting (I-V), which eventually continues into the emergency department (Sørlie *et al.* 2004) and beyond in the health-care system is important for the patient's overall experience (I). All of the patient's senses are involved in their care or medical experience. Patients and staff can differ in their perceptions of what is considered to be a good atmosphere and a good social climate (Schjødt *et al.* 2003). The PEC personnel give the patients a feeling of safety and security (I-IV). They make lasting impressions on their patients who remember their PEC experiences rather well (I). The atmosphere in which the PEC personnel work is of importance in order to create a good working environment and better cooperation (IV) in order to give high quality service to those in need of help (I-V). If the atmosphere is fraught with a sense of indecision it can be felt and passed on throughout the entire PEC chain.

The PEC system

Leadership, economic, logistic and legal aspects are important in PEC (I-V). In PEC the patients are dependent on the availability of ambulances, which is governed by the number purchased by management (I). The patient is not always aware that a decision made by management has lead to their dissatisfaction with the care they received that began when they felt they were waiting too long for an ambulance to arrive (I-II). When patients have to wait for what they perceive as being an unnecessarily long time for care due to organisational shortcomings or cutbacks in the PEC system, their level of dissatisfaction can increase. It is also important the managers realise the risk that new roles and changes can create a culture of uncertainty (Williams & Sibbald 1999). For the PEC personnel it is the PEC system and organisation that regulates the

possibilities for what can be done. Health-care policies are changing internationally, nationally (Koivusalo 2005) and on the local level, which can have an impact on the working environment and the individuals working in the health-care system. Political decisions and economical issues can even have a trickle down effect all the way down to the care the patient receives. A lack of political interest and economic support can lead to dissatisfied patients as well as PEC personnel.

This model can facilitate an examination of the PEC chain by breaking it down into five aspects in order to discover its' strengths and weaknesses. It can influence holistic perceptions of patient care. In PEC providing good quality care and service that is not only practical and productive but also ethical and aesthetic, requires knowledge. This model can stimulate new ways of thinking and reflection and thereby help improve PEC. The model can be useful as a theoretical model in PEC education as well as in concrete practical situations in order to achieve increased satisfaction in this first link of the health-care system. Although the theoretical model seems to have simple principles it can be useful and relevant. The caring theory presented by Martinsen challenges society, politicians and the health-care workers to realize the value of caring through concrete policies and care practices. Martinsen wants us to put ourselves mentally into the situation and arrive at a choice of action based on situational understanding, professional insight and caring (Martinsen 2006, Ahlsvåg 2006).This theoretical model can be a tool to do just that. It can be used by the PEC personnel as well as other health-care workers in order to reflect on and become aware of their work situation and thereby better serve patients (Forslund *et al.* 2007).

Methodological considerations

A descriptive design was used in all five papers included in this thesis. Most of the data analysis has been qualitative (I-IV). In one paper (V) a combination of qualitative analysis and descriptive statistics was carried out. Data was collected from interviews (I-IV), a questionnaire and written comments (V). In study V frequencies as well as quotations were used to illuminate perceptions of quality. Both numbers and words are two fundamental languages used in human communication. The intention behind the use of a combination of data collection methods as well as the use of different

participants in this thesis was to capture varying perspectives (I-V) and to reach a deeper understanding (I-III) of PEC experiences.

Papers I-IV

In papers I-III a qualitative approach (Malterud 1998) was used to reach a deeper understanding and meaning of how it was being a patient with acute chest pain that received PEC (I), a spouse that called for help for someone in that situation (II) and how emergency operators working at the EMD-centre deal with difficult situations (III). Qualitative research is designed to study research problems that inquire into the meaning of what the individual or group describes is a human or social problem, or phenomena (Creswell 2007). A qualitative approach can be useful when the issues are complex and the answers are complicated (Malterud 1998). The aims of papers I-IV seemed best approached using narrative research interviews. The participants decided which experiences and relationships they felt were most important in making their own actions understandable (Befring 1994). The interviews (I-III) captured individual descriptions of situations the participants have experienced, which would not have been possible if a questionnaire had been used. The textual analysis of the interviews was based on a phenomenological-hermeneutic approach (I-III) (Lindseth & Norberg 2004), which seemed appropriate since the intention of this approach is to grasp the meaning of the participants lived experience. The analysis process has been described such that the reader should be able to follow the steps that were taken (I-III) (Lindseth & Norberg 2004). The phenomenological-hermeneutic approach inspired by Ricouer (1976) is meant to reveal the meaning behind the text. The interviewees cannot validate the interpretation, as they are not always aware of what their narrations have exposed. The trustworthiness should be seen in light of what the text is directed towards. There is more than one way to interpret a text, but one is more probable than others (Ricoeur 1976). The interpretations in papers I-III were the ones the authors found to be the most probable. The authors' interpretations were made from their pre-understandings and perspectives they gained through their experiences as RNs working in emergency and primary care, and as researchers. Co-assessments (I-III) increased the trustworthiness of the findings. Malterud (1998) writes that the probability that a finding is valid increases when more people agree upon the reasonableness of the findings. Within qualitative research, consensus assessment is not generally relevant for

validation, but it can be useful to see the data from different perspectives and from a different knowledge base.

The audio taped interviews (I-IV) took different lengths of time and were transcribed verbatim. Even though some of the interviews did not seem to last very long the text they produced was rich in content and it is the richness of the content that is important when analysing the text. When one participant (III-IV) did not allow the use of a tape-recorder, the content of the written notes that were taken during the interviews were confirmed with the interviewee directly afterwards. This text was analysed in the same manner as the others. The interviews in papers I-II were carried out one to three weeks after the emergency call was made when the situations still were vivid and the interviewees were keen to tell their experiences. The interviews for paper IV were carried out in the same way as those for papers I-III, but in paper IV another qualitative approach was used for the analysis.

Qualitative content analysis was used to analyse the text from the interviews with emergency operators and RNs (IV). The interpretation of the written text can range from a concrete to an abstract level and from a manifest that was performed in paper V, to a latent level which was performed in paper IV (Graneheim & Lundman 2004). The interview text from the emergency operators and the RNs (IV) was analysed separately and the findings are presented in two parts. The steps in this type of analysis differ from the other in that coding of the condensed meaning units is done before the sub-categories, categories and themes are identified. In the analysis in paper IV it was possible to make an interpretation of the underlying meaning, the latent message. Co-assessments increased the trustworthiness of the findings (IV) (Graneheim & Lundman 2004). The findings were discussed among the researchers; and a theme was identified and reflected upon in the discussion section. PEC is organized differently throughout the world, even within the Nordic countries (Langhelle *et al.* 2004). The findings presented are from people living in Sweden that have access to, or work in the socialized Swedish health-care system and since the organisation of health-care systems is different worldwide, the findings cannot be generalised. Even though it is not possible to generalise the findings, they are credible if persons with similar experiences recognise the descriptions and interpretations (Sandelowski 1986), and they can be transferred to similar situations (Ricouer 1976). The findings can be understood, transferred and applied to similar situations in a new

context (Sandelowski 1986) such as other prehospital care settings. Appropriate quotations and descriptions of data collection, analysis, setting and participants facilitate the transferability (Graneheim & Lundman 2004).

Paper V

Paper V involved the use of a questionnaire addressed to ambulance personnel. The questionnaire was an initial attempt to describe the quality of the information given to the ambulance personnel from the EMD-centre. The ambulance supervisors took part in the development of the questionnaire together with the researchers. Future studies will be of interest where new instruments can be developed and tested for validity and reliability (Polit & Beck 2004). A scale with several degrees of agreement or disagreement had been more appropriate in this study than the dichotomous "Yes" or "No" answer type used. In one area it was possible to make written comments to the questions related to the quality of the information given by the EMD personnel. These comments were analysed using manifest content analysis. The analysis dealt with the written comments and focused closely on what was written (Baxter 1991). The manifest content of the written comments was a description close to the text (Graneheim & Lundman 2004). The short written comments cannot describe the complete reason for the assessments. Qualitative and quantitative research methods have complementary strengths and weaknesses. An integrated approach can therefore give insights into the multidimensional nature of reality (Polit & Beck 2004). A combination of methods can be used to expand the scope of the study when the researchers seek various dimensions of a phenomenon (Sandelowski 2000), which in our case was the quality of information given.

The limited geographical uptake area and the subsequent composition of the participants may have affected the papers in this thesis. It is possible that if we had had the option of selecting participants from a wider area, perhaps nationally, different findings may have developed. As "no single study can ever definitively answer a research question" (Polit & Beck 2004) future studies would be of interest both nationally and internationally especially since research within the prehospital field is relatively limited compared with others within the health-care system.

CONCLUSION

Existing in PEC are many interdependent complexities that present demands and challenges to all the actors involved (I-V). In general those who have received acute assistance from PEC were satisfied, but the margins between success and failure are small. Risks for errors exist throughout the PEC chain and time poses a challenge. To understand the acute situation and be understood is crucial for all involved in PEC and the same situation can be experienced differently. The challenges inherent in PEC are daring to be in the acute situation either directly or indirectly. In addition there are challenges associated with aloneness, uncertainty, vulnerability and the unpredictable situations that can occur. Dependency on each other is another challenge. Those in need of acute help (I-II) are dependent upon the PEC personnel (III-V), system and organisation. PEC personnel are also dependent upon the system and organisation as well as each other and the caller. All involved must rely on and are dependent upon the information supplied and or relayed, and another person's interpretation of the situation. Individualised care is important to strengthen trust and confidence for those in need of PEC. More information addressing the problem of hesitation in calling with acute chest pain problems can help save lives.

Working in PEC is challenging since every call and every situation is unique and people's lives are at stake. Personnel are challenged if they do not have the ability to see the patient they are supposed to help. They have to make serious decisions based on the contact made by phone. Personnel skills, experience, professional knowledge and a caring attitude are important attributes for those working in PEC. The PEC personnel have the authority and power to act and make decisions, in which responsibility, sensitivity and human dignity must be addressed. Lives are saved every day with PEC despite all the challenges and possibilities for error. With the insights provided by this thesis the challenges can perhaps be better understood and dealt with. A model has been presented that can be of use in this quest.

SUMMARY IN SWEDISH (SVENSK SAMMANFATTNING)

Utmaningar i den prehospitala akutsjukvården – patient-, anhörig- och personalperspektiv

Avhandlingsarbetet har inriktning mot den prehospitala akutsjukvården, de sjukvårds- och hjälpinsatser som görs innan patienten kommer in till sjukhus. Prehospital akutsjukvård innebär tidigt insatt kvalificerad första hjälp vid skada eller sjukdom, från larmsamtalet till de insatser som görs på plats för skada och sjukdom, eller under transport till vårdinrättningen. Dygnet runt och året om tar larmoperatörer på landets larmcentraler emot samtal från människor som är i nöd eller i behov av akut hjälp. Larmoperatören är den första person som den sjuke eller nödställde möter i vårdkedjan, och larmsamtalet är ett kort möte som kan vara avgörande för det kommande omhändertagandet, och där görs en första medicinsk bedömning. Larmoperatörerna har ett års teoretisk och praktisk utbildning inom företaget SOS Alarm, och de testas årligen avseende simultankapacitet och stress.

Avancerad medicinsk teknologi och behandlingar har i allt högre grad flyttats från sjukhusen ut till patienternas hem och vårdboenden. Alltmer högteknologisk utrustning används inom ambulanssjukvården. Utbildningskraven inom ambulanssjukvården har höjts, och numera skall varje ambulans ha en sjuksköterska i teamet. Snabb behandling på olycksplatsen eller på platsen för insjuknandet spar människoliv och kan begränsa och förhindra komplikationer, vilket minskar det mänskliga lidandet. Minskat antal vårdplatser på sjukhus, kortare vårdtider och en allt mer åldrande befolkning är en verklighet i dagens sjukvård. Dessa omständigheter kan komma att öka kraven på den prehospitala personalen, som arbetar utanför sjukhusen. Det var därför av stort intresse att undersöka hur patienter, anhöriga och personal upplever den prehospitala vården, då relativt få svenska studier är gjorda inom detta vårdområde.

Syfte med avhandlingen

Det övergripande syftet med avhandlingen var att beskriva utmaningar i den prehospitala akutsjukvården utifrån patienternas, de anhörigas och personalens erfarenheter.

Delstudie I: Patientperspektiv

Akut bröstsmärta är en vanlig orsak till att människor kontaktar landets larmcentraler. Syftet med studien var att belysa hur patienter med akut bröstsmärta upplever larmsamtalet och den prehospitala akutsjukvården. Tretton patienter intervjuades som själva ringt larmsamtalet, och en fenomenologisk-hermeneutisk ansats användes i analysen. Patienterna var tacksamma att deras liv hade räddats, men några ansåg att det tog för lång tid innan larmoperatören svarade på samtalet och förstod brådskan. De befann sig i en livshotande situation och känslan av sårbarhet och beroende var stor. Tiden verkade stå stilla när de väntade på hjälp. Situationen var fylld av smärta, rädsla, osäkerhet och en känsla av ensamhet. Akut bröstsmärta är ett tillstånd som den prehospitala personalen har väl invanda rutiner för hur de skall hantera, men för patienterna är det unika situationer. Individuellt omhändertagande var viktigt för patienterna i det korta vårdmötet för att stärka tilltro och förtroende mellan patienten och den prehospitala personalen. Patienterna var säkra på vilket larmnummer de skulle ringa, men var osäkra på när de skulle ringa. Mer information kan behövas, då fler liv kan räddas om människor inte tvekar och fördröjer kontakten.

Delstudie II: Anhörigperspektiv

Larmsamtalet 112 till SOS Alarm, det företag som driver de svenska larmcentralerna är ofta en persons första kontakt med hälso- och sjukvårdssystemet i händelse av akut sjukdom eller olycksfall, och akut bröstsmärta är en vanlig orsak till denna kontakt. Syftet med studien var att belysa hur de närmast anhöriga till patienter med akut bröstsmärta upplevde larmtillfället, larmsamtalet och den prehospitala akutsjukvården. Intervjuer genomfördes med sex äkta män och tretton hustrur som ringde larmsamtalet när deras partner hade symtom på akut bröstsmärta och larmsamtalen blev bedömda som högsta prioritet. I analysen av intervjumaterialet användes en fenomenologisk-hermeneutisk ansats. Ett överordnat tema, ”Ensamhet”, identifierades, jämte ytterligare två teman, “Ansvar”, och ”Känsla av obehag”. Utmaningen i att vara

anhörig till en person i behov av akut medicinsk assistans och akutsjukvård tolkades som att ”Vara ansvarig och försöka rädda liv” och ”Kunna hantera känslan av obehag och känna tilltro i en osäker situation”. De anhöriga med sin känsla av ensamhet var i en eskalerande spiral av oro, osäkerhet, stress, rädsla för förlust samt desperation när deras partners liv var i fara. De måste hantera den känslomässiga våndan och de kände sig tvingade att agera för att rädda liv, en situation som var en utmaning att klara.

Delstudie III: Larmoperatörernas perspektiv

Larmoperatörer på SOS Alarm är ansvariga för prioritering och fördelning av resurser till de inkommande larmsamtalen. Syftet med studien var att analysera vilka situationer som larmoperatörerna ansåg svårbedömda samt deras reflektioner över hur de hanterade dessa situationer. Intervjuer genomfördes med 16 larmoperatörer. En fenomenologisk-hermeneutisk ansats användes i analysen. Osäkerhet, bl.a. i form av kommunikationsproblem såsom kommunikationshandikapp, främmande språk eller medicinsk terminologi karaktäriserade situationer som var svårbedömda. Då de tillgängliga resurserna inte räckte till försvårade dessutom situationen. Erfarenhet, yrkesmässig och personlig kunskap ansågs vara viktiga egenskaper för att klara dessa situationer, liksom personliga kvaliteter såsom lyhördhet, självkännedom, empati och inlevelseförmåga. Larmoperatörerna ansåg att de behövde mer handledning, utbildning och feedback.

Delstudie IV: Larmoperatörernas och sjuksköterskornas perspektiv

Den prehospitala delen av vårdkedjan är specialiserad och hanterar högteknologisk utrustning. Kommunikationsproblem och oförutsebara situationer kan uppstå under larmsamtalet. Under en tvåårsperiod tillfördes fyra sjuksköterskor till teamet på larmcentralen. Syftet med studien var att beskriva hur sjuksköterskor och larmoperatörer upplevde samarbetet när sjuksköterskorna under två år hade arbetat tillsammans med larmoperatörerna för att tillföra högre medicinsk- och omvårdnads kompetens. Intervjuer genomfördes med 15 larmoperatörer och 4 sjuksköterskor och kvalitativ innehållsanalys användes som analysmetod. Den initiala frustrationen och skepticismen ändrades till en mer positiv erfarenhet som resulterade i bättre samarbete och service. Sjuksköterskorna ansåg att de mest akuta larmsamtalen var svåra att hantera. Larmoperatörerna däremot ansåg de diffusa och komplicerade fallen vara de

svåraste att hantera. De två professionerna kompletterade varandra. Genom att kombinera sjuksköterskornas och larmoperatörernas kunskap och erfarenhet bör det vara möjligt att förbättra för dem som behöver akut medicinsk vård.

Delstudie V: Ambulanssjukvårdarnas perspektiv

Syftet med denna studie var att beskriva ambulanspersonalens uppfattnng om kvaliteten på den information de fått från larmcentralen angående larm om akut bröstsmärta och dessutom att beskriva karaktäristika av hög respektive icke hög kvalitet från ambulanspersonalens perspektiv. Genom en enkät tillfrågades ambulanspersonalen angående den information de fått från larmcentral och kvaliteten på den givna informationen; dessutom innehöll enkäten en öppen fråga varför de skattade informationen som de gjorde. Totalt inkluderades 336 larm angående akut bröstsmärta som alla hade högsta prioritet. Ambulanspersonalen angav informationen som hög kvalitet i 203 larm och som icke hög kvalitet i 133 larm. I de skrivna kommentarerna framkom att hög kvalitet associerades med relevant bedömning av larmet, information om patientens smärttillstånd och tillräcklig information om patientens tillstånd och sjukhistoria. Det ansågs viktigt att patienten var informerad och förberedd och att hanteringen av larmet gjordes snabbt och med precision. Brister i bedömning och osäkerhet i informationen associerades med icke hög kvalitet. Hög kvalitet på informationen är en förutsättning för ambulanspersonalens möjlighet att förstå och förbereda sig för den akuta situation de skall möta. Resultatet kan vara till hjälp för larmoperatörerna i deras praktiska arbete så att mer information av hög kvalitet når ambulanspersonalen.

Konklusion

Komplexiteten i situationerna i den prehospitala akutsjukvården är krävande och utmanande för de olika aktörerna (I-V). I allmänhet var de som fick hjälp från den prehospitala akutsjukvården nöjda, men det är liten marginal mellan framgång och misslyckande. Det finns risk att det kan gå fel och tiden är en utmaning. Att förstå den akuta situationen och att bli förstådd är mycket viktigt för alla involverade, och samma situation kan upplevas olika. En utmaning är att våga vara och stanna kvar i den akuta situationen. Dessutom är det utmaningar i samband med ensamhet, osäkerhet, sårbarhet och oförutsägbarhet. Beroendet av andra är en annan utmaning. De personer

som är i akut behov av hjälp är beroende av den prehospitala personalen och dess organisation. Den prehospitala personalen är också beroende av en fungerande organisation, av varandra och av information från den hjälpsökande. Alla involverade i den prehospitala akutsjukvården är beroende av den information de fått och utbytt, och av en annan människas tolkning av situationen. Individualiserad vård är viktig för att stärka tilltro och förtroende hos dem som behöver hjälp från den prehospitala akutsjukvården. Liv kan räddas med mer information om de risker som tvekan att ringa larmsamtalet innebär.

Arbetet i den prehospitala akutsjukvården är en utmaning, då varje larmsamtal och akut situation är unik och människors liv kan stå på spel. Personalen tar viktiga beslut baserade på kontakt via telefon, och det är en utmaning att inte se den de skall hjälpa. Yrkesmässig och personlig kunskap, erfarenhet och en omvårdande attityd är viktigt för den personal som arbetar i den prehospitala akutsjukvården. Personalen har befogenhet och makt att agera och ta beslut, vilket kräver förmåga att ta ansvar, fingertoppskänsla, ödmjukhet och respekt. Trots komplexiteten och riskerna i den prehospitala akutsjukvården räddas många liv dagligen. Denna avhandling kan bidra till ökad insikt och förståelse för den prehospitala akutsjukvårdens situation och ge möjlighet till att förbättra hanteringen av dess utmaningar.

ACKNOWLEDGEMENTS

I want to express my warm and sincere gratitude and appreciation to all who have supported me, and in different ways contributed to this thesis. I especially want to thank:

All the patients, spouses, emergency operators, nurses and ambulance personnel who participated and shared their experiences, without whom this work would not has been possible.

Professor Venke Sørlie, my main advisor for your excellent guidance and constructive criticism. Thank you for encouraging, supporting and inspiring me in my work and for your generosity in sharing your scientific knowledge.

Professor Margareta Ehnfors and PhD Margareta Gustafsson my co-advisors for your wisdom, support and valuable comments that helped me reach my goal.

Professor Mona Kihlgren, my previous advisor who brought me to the Centre of Nursing Science (nowadays Centre for Health Care Sciences) and introduced me to nursing research.

My co-authors; Annica Kihlgren, Robin Quell and Ingela Östman, for their different contributions and excellent cooperation.

Robin Quell for helping me organize my thoughts and express them in English. For our good teamwork and friendship, all the way to the end.

Professor Gerd Ahlström, Professor Anna Kristina Ek, PhD Helena Sunvisson and all of my doctoral colleagues past and present from Örebro, Linköping and KI Stockholm for your support and stimulating discussions during seminars.

Birgitte Kolsung, research administrator at Örebro University for support with all the practical issues that I needed to deal with as a doctoral student.

Maria Ekholm-Takman for transcribing the interviews and helping with the various practical details.

All colleagues at the Centre for Health Care Sciences past and present and to the Head of the Department Margareta Möller, for your input and backing.

Margareta Landin, chief librarian, Liz Holmgren, librarian and all your colleagues at the Medical Library, Örebro University Hospital for your excellent service.

Inger Jonsson, PhD, Department of Restaurant and Culinary Arts, Örebro University who introduced me to the FAMM model.

All my teacher colleagues at the Department of Health Sciences, Örebro University for your support and encouragement.

My husband Jan, my children and their families: Malin & Jonny and their children Filip and Ella, Anna & Johan and their sons Viktor and David, and Fredrik, my beloved and invaluable family and joy in my life, thank for your patience when my world has been overwhelmingly research, for all your support and encouragement throughout this incredible journey.

REFERENCES

Ahl, C., Nyström, M. & Jansson, L. (2006) Making up one's mind:--patients' experiences of calling an ambulance. *Accident and Emergency Nursing* **14,** 11-19.

Ahlsvåg, H. (2006) Philosophy of caring. In: Marriner-Tomey, A. & Alligood, M. R. (eds) *Nursing theorists and their work*. 6th ed, Mosby, St. Louis, pp. 167-190.

Anderbring, B., Strandell, M. & Åkerlund, K. (1998) *Alarm! : om alarmeringens historia*. SOS Alarm, Stockholm [in Swedish].

Arbon, P. (2004) Understanding experience in nursing. *Journal of Clinical Nursing* **13,** 150-157.

Barnard, A. & Sandelowski, M. (2001) Technology and humane nursing care: (ir)reconcilable or invented difference? *Journal of Advanced Nursing* **34,** 367-375.

Barnhart, J. M., Cohen, O., Kramer, H. M., Wilkins, C. M. & Wylie-Rosett, J. (2005) Awareness of heart attack symptoms and lifesaving actions among New York City area residents. *Journal of Urban Health* **82,** 207-215.

Baxter, L. A. (1991) Content analysis. In: Montgomery, B. M. & Duck, S. (eds) *Studying interpersonal interaction*. Guilford, New York, pp. 239-254.

Befring, E. (1994) *Forskningsmetodik och statistik*. Studentlitteratur, Lund [in Swedish].

Black, J. J. & Davies, G. D. (2005) International EMS systems: United Kingdom. *Resuscitation* **64,** 21-29.

Bruce, K. & Suserud, B. O. (2005) The handover process and triage of ambulance-borne patients: the experiences of emergency nurses. *Nursing in Critical Care* **10,** 201-209.

Bång, A. (2002). *Emergency medical dispatch - the first medical response for life-threatening conditions : assessment and intervention of patients with chest pain and/or suspected cardiac arrest*. [dissertation]. Göteborg University, Göteborg.

Cioffi, J. (2001) A study of the use of past experiences in clinical decision making in emergency situations. *International Journal of Nursing Studies* **38,** 591-599.

Clawson, J. J. & Sinclair, R. (2001) The emotional content and cooperation score in emergency medical dispatching. *Prehospital Emergency Care* **5,** 29-35.

Cooke, M. W. & Wilson, S. (1998) Are 999 callers in a position to give triage information and receive first aid advice? *Pre-hospital Immediate Care* **2,** 193-196.

Creswell, J. W. (2003) *Research design : qualitative, quantitative, and mixed methods approaches*. 2nd ed, Sage Publications, Thousand Oaks, Calif.

Creswell, J. W. (2007) *Qualitative inquiry & research design : choosing among five approaches*. 2nd ed, Sage Publications, Thousand Oaks, Calif.

Davis, L. A. (2005) A phenomenological study of patient expectations concerning nursing care. *Holistic Nursing Practice* **19,** 126-133.

Dewey, J. (1980) *The quest for certainty: a study of the relation of knowledge and action*. Perigee, New York.

Eide, H. & Eide, T. (1997) *Omvårdnadsorienterad kommunikation : relationsetik, samarbete och konfliktlösning*. Studentlitteratur, Lund [in Swedish].

Eriksson, M. & Svedlund, M. (2006) 'The intruder': spouses' narratives about life with a chronically ill partner. *Journal of Clinical Nursing* **15,** 324-333.

Farmer, S. A., Roter, D. L. & Higginson, I. J. (2006) Chest pain: communication of symptoms and history in a London emergency department. *Patient Education and Counseling* **63,** 138-144.

Felgen, J. (2004) A caring and healing environment. *Nursing Administration Quarterly* **28,** 288-301.

Forslund, K., Kihlgren, M. & Sørlie, V. (2005) Five Aspect Meal Model (FAMM) - a tool for nursing practice and education. In: Beedholm, K., Buus, N., Malchau, S., Moos, I. & Zeitler, U. (eds) *Theory and Practice in Nursing Education. 4th International Research and Development Conference, Århus, Denmark, 24-26 Aug, 2005*. Center for Innovation in Nursing Education, Aarhus.

Forslund, K., Quell, R., Kihlgren, M. & Sørlie, V. (2007) Innovating nursing practice, education and management – inspirations from another discipline. Manus.

French, B. (2006) Uncertainty and information need in nursing. *Nurse Education Today* **26,** 245-252.

Frid, I., Bergbom, I. & Haljamae, H. (2001) No going back: narratives by close relatives of the braindead patient. *Intensive and Critical Care Nursing* **17,** 263-278.

Gadamer, H. C. (2002) *Sanning och metod : i urval*. Daidalos, Göteborg [in Swedish].

Gouvras, G. (2004) Policies in place throughout the world: action by the European Union. *International Journal of Infectious Diseases* **8** (Suppl 2), S21-30.

Graneheim, U. H. & Lundman, B. (2004) Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today* **24,** 105-112.

Gustafsson, I.-B. (2004) Culinary arts and meal science - a new scientific research discipline. *Food Service Technology* **4,** 9-20.

Gustafsson, I.-B., Öström, Å., Johansson, J. & Mossberg, L. (2006) The Five Aspects Meal Model: a tool for developing meal services in restaurants. *Journal of Foodservice* **17,** 84-93.

Göransson, K., Ehrenberg, A., Marklund, B. & Ehnfors, M. (2005) Accuracy and concordance of nurses in emergency department triage. *Scandinavian Journal of Caring Sciences* **19,** 432-438.

Herlitz, J. & Holmberg, S. (2004) *Nationellt register för hjärtstopp utanför sjukhus. Årsrapport 2004*. Sandstens, Göteborg [in Swedish].

Herlitz, J., Starke, M., Hansson, E., Ringvall, E., Karlson, B. W. & Waagstein, L. (2002) Early identification of patients with an acute coronary syndrome as assessed by dispatchers and the ambulance crew. *American Journal of Emergency Medicine* **20,** 196-201.

Hjälte, L. (2005) *Hur används ambulanssjukvårdens resurser? : en deskriptiv studie om utnyttjandet av ambulanser och ambulanssjukvård i Västra Götalandsregionen*. Centrum för hälso- och sjukvårdsanalys (CHSA), Göteborg (Rapport / Centrum för hälso- och sjukvårdsanalys; 18) [in Swedish].

Ingarfield, S. L., Jacobs, I. G., Jelinek, G. A. & Mountain, D. (2005) Patient delay and use of ambulance by patients with chest pain. *Emergency Medicine Australasia* **17,** 218-223.

Johansson, I., Strömberg, A. & Swahn, E. (2004) Ambulance use in patients with acute myocardial infarction. *Journal of Cardiovascular Nursing* **19,** 5-12.

Johnston, S., Brightwell, R. & Ziman, M. (2006) Paramedics and pre-hospital management of acute myocardial infarction: diagnosis and reperfusion. *Emergency Medicine Journal* **23,** 331-334.

Jonasson, P. & Wallman-C:son, K. A. (1999) Ambulanssjukvård : den svenska modellen. *Akutjournalen* **6,** 4-6 [in Swedish].
Jones, G. E. & Machen, I. (2003) Pre-hospital pain management: the paramedics' perspective. *Accident and Emergency Nursing* **11,** 166-172.
Jonsson, A. (2004). *Stress efter traumatiska händelser : ambulanspersonalens vardag.* [dissertation]. Göteborgs universitet, Göteborg [in Swedish].
Jonsson, A., Segesten, K. & Mattsson, B. (2003) Post-traumatic stress among Swedish ambulance personnel. *Emergency Medicine Journal* **20,** 79-84.
Karlsten, R. & Elowsson, P. (2004) Who calls for the ambulance: implications for decision support. A descriptive study from a Swedish dispatch centre. *European Journal of Emergency Medicine* **11,** 125-129.
Kaur, R., Lopez, V. & Thompson, D. R. (2006) Factors influencing Hong Kong Chinese patients' decision-making in seeking early treatment for acute myocardial infarction. *Research in Nursing and Health* **29,** 636-646.
Killeen, C. (1998) Loneliness: an epidemic in modern society. *Journal of Advanced Nursing* **28,** 762-770.
Koivusalo, M. T. (2005) The future of European health policies. *International Journal of Health Services* **35,** 325-342.
Kristensson Uggla, B. (1994) *Kommunikation på bristningsgränsen : en studie i Paul Ricoeurs projekt.* B. Östlings bokförl., Stockholm [in Swedish].
Ladd, R. E. (1985) Patients without choices: the ethics of decision-making in emergency medicine. *Journal of Emergency Medicine* **3,** 149-156.
Langhelle, A., Lossius, H. M., Silfvast, T., Björnsson, H. M., Lippert, F. K., Ersson, A. & Søreide, E. (2004) International EMS Systems: the Nordic countries. *Resuscitation* **61,** 9-21.
Leonard, M., Graham, S. & Bonacum, D. (2004) The human factor: the critical importance of effective teamwork and communication in providing safe care. *Quality & Safety in Health Care* **13** (Suppl 1), i85-90.
Lindseth, A., Marhaug, V., Norberg, A. & Udén, G. (1994) Registered nurses' and physicians' reflections on their narratives about ethically difficult care episodes. *Journal of Advanced Nursing* **20,** 245-250.
Lindseth, A. & Norberg, A. (2004) A phenomenological hermeneutical method for researching lived experience. *Scandinavian Journal of Caring Sciences* **18,** 145-153.
MacFarlane, C., van Loggerenberg, C. & Kloeck, W. (2005) International EMS systems in South Africa--past, present, and future. *Resuscitation* **64,** 145-148.
Malterud, K. (1998) *Kvalitativa metoder i medicinsk forskning.* Studentlitteratur, Lund [in Swedish].
Manias, E. & Street, A. (2000) The handover: uncovering the hidden practices of nurses. *Intensive and Critical Care Nursing* **16,** 373-383.
Martinsen, K. (1989) *Omsorg, sykepleie og medisin : historisk-filosofiske essays.* Tano, Oslo [in Norwegian].
Martinsen, K. (1993a) *Den omtenksamme sykepleier.* Tano, Oslo [in Norwegian].
Martinsen, K. (1993b) *Fra Marx til Løgstrup. Om etikk og sanselighet i sykepleien.* Tano, Oslo [in Norwegian].
Martinsen, K. (2000) *Øyet og kallet.* Fagboksförlaget, Bergen [in Norwegian].
Martinsen, K. (2006) *Care and vulnerability.* Akribe, Oslo.
McConnel, C. E. & Wilson, R. W. (1998) The demand for prehospital emergency services in an aging society. *Social Science and Medicine* **46,** 1027-1031.

Melby, V. (2000) Experiential learning in pre-hospital emergency care: a qualitative study. *Nurse Education Today* **20,** 638-645.
Melby, V. & Ryan, A. (2005) Caring for older people in prehospital emergency care: can nurses make a difference? *Journal of Clinical Nursing* **14,** 1141-1150.
Mishler, E. (1986) *Research interviewing: context and narrative*. Harvard University Press, Cambridge, Mass.
Mistovich, J., Hafen, B. & Karren, K. (2004) *Prehospital emergency care*. 7th ed, Pearson/Prentice Hall, Upper Saddle River, NJ.
Morgans, A., Archer, F., Walker, T. & Thuma, E. (2005) Barriers to accessing ambulance services in rural Victoria for acute asthma: patients' and medical professionals' perspectives. *Australian Journal of Rural Health* **13,** 116-120.
Moser, D. K., McKinley, S., Dracup, K. & Chung, M. L. (2005) Gender differences in reasons patients delay in seeking treatment for acute myocardial infarction symptoms. *Patient Education and Counseling* **56,** 45-54.
Nationalencyklopedin. (2000). from http://www.ne.se
Nilsson, B. & Waldemarsson, A. K. (1994) *Kommunikation : samspel mellan människor*. 2nd ed, Studenlitteratur, Lund [in Swedish].
Nyström, M. (2003) *Möten på en akutmottagning : om effektivitetens vårdkultur*. Studenlitteratur, Lund.
Okhravi, M. (2002) Causes for pre-hospital and in-hospital delays in acute myocardial infarction at Tehran teaching hospitals. *Australian Emergency Nursing Journal* **5,** 21-26.
Olsen, R. & Helland-Finstad, H. (2003) *Snakk om erfaring - en undersøkelse av å samtale om praktisk kunskap. HBO-rapport 4/2003*. Høgskolen, Bødø [in Norwegian].
Penrod, J. (2001) Refinement of the concept of uncertainty. *Journal of Advanced Nursing* **34,** 238-245.
Pettinari, C. J. & Jessopp, L. (2001) "Your ears become your eyes": managing the absence of visibility in NHS Direct. *Journal of Advanced Nursing* **36,** 668-675.
Polit, D. F. & Beck, C. T. (2004) *Nursing research : principles and methods*. 7th ed, Lippincott Williams & Wilkins, Philadelphia. pp. 273-288.
Pozner, C. N., Zane, R., Nelson, S. J. & Levine, M. (2004) International EMS systems: The United States: past, present, and future. *Resuscitation* **60,** 239-244.
Quinn, J. R. (2005) Delay in seeking care for symptoms of acute myocardial infarction: applying a theoretical model. *Research in Nursing and Health* **28,** 283-294.
Ricouer, P. (1976) *Interpretation theory : discourse and the surplus of meaning*. Texas Christian University Press, Forth Worth.
Ryynänen, O. P., Myllykangas, M., Kinnunen, J. & Takala, J. (1999) Attitudes to health care prioritisation methods and criteria among nurses, doctors, politicians and the general public. *Social Science and Medicine* **49,** 1529-1539.
Sandelowski, M. (1986) The problem of rigor in qualitative research. *ANS. Advances in Nursing Science* **8,** 27-37.
Sandelowski, M. (2000) Combining qualitative and quantitative sampling, data collection, and analysis techniques in mixed-method studies. *Research in Nursing and Health* **23,** 246-255.
Schjødt, T., Middelboe, T., Mortensen, E. L. & Gjerris, A. (2003) Ward atmosphere in acute psychiatric inpatient care: differences and similarities between patient and staff perceptions. *Nordic Journal of Psychiatry* **57,** 215-220.

Schoenberg, N. E., Peters, J. C. & Drew, E. M. (2003) Unraveling the mysteries of timing: women's perceptions about time to treatment for cardiac symptoms. *Social Science and Medicine* **56,** 271-284.
Sefring, P. & Weidringer, J. W. (1991) History of Emergency Medicine in Germany. *Journal of Clinical Anaesthesiology* **3,** 245-248.
SFS 1982:763. *Hälso och sjukvårdslag.* Socialdepartementet, Stockholm [in Swedish].
Shattell, M. M., McAllister, S., Hogan, B. & Thomas, S. P. (2006) "She took the time to make sure she understood": mental health patients' experiences of being understood. *Archives of Psychiatric Nursing* **20,** 234-241.
Shuster, M., Keller, J. & Shannon, H. (1995) Effects of prehospital care on outcome in patients with cardiac illness. *Annals of Emergency Medicine* **26,** 138-145.
Sikka, N. & Margolis, G. (2005) Understanding diversity among prehospital care delivery systems around the world. *Emergency Medicine Clinics of North America* **23,** 99-114.
Skandalakis, P. N., Lainas, P., Zoras, O., Skandalakis, J. E. & Mirilas, P. (2006) "To afford the wounded speedy assistance": Dominique Jean Larrey and Napoleon. *World Journal of Surgery* **30,** 1392-1399.
Socialstyrelsen. (1994) *Akut omhändertagande : ett underlag för kompetensutveckling vid omhändertagande av akut sjuka och skadade.* Socialstyrelsen, Stockholm [in Swedish].
Socialstyrelsen. (1997) *Larmoperatörer med sjukvårdsuppgifter : arbetsuppgifter, krav på kompetens, kvalitet, uppföljning, tillsyn.* Socialstyrelsen, Stockholm (SoS-rapport ; 1997:3) [in Swedish].
Socialstyrelsen (1998) Speciella förhållanden i hälso- och sjukvården. 3:1 Akut omhändertagande. In: *Sjukvården i Sverige 1998*. Socialstyrelsen, Stockholm, pp. 56-72 [in Swedish].
Socialstyrelsen. (2002) *Medicinsk kompetens i ambulansalarmering.* Socialstyrelsen, Stockholm [in Swedish].
Socialstyrelsen. (2004) *Svensk ambulanssjukvård 2003*. Socialstyrelsen, Stockholm [in Swedish].
Socialstyrelsen. (2006) *God vård : om ledningssystem för kvalitet och patientsäkerhet i hälso- och sjukvården.* Socialstyrelsen, Stockholm [in Swedish].
SOS Alarm (2005) SOS Alarm verksamhetsrapport 2004 [in Swedish].
SOS Alarm. (2007). *Information SOS Alarm [in Swedish]*. Retrieved March 5th, 2007, from www.sosalarm.se
SOSFS 1993:17. *Socialstyrelsens allmänna råd : Omvårdnad inom hälso- och sjukvården.* Socialstyrelsen, Stockholm [in Swedish].
SOSFS 1999:17. *Föreskrifter om läkemedelshantering inom ambulanssjukvården.* Socialstyrelsen, Stockholm [in Swedish].
SOSFS 2000:1. *Socialstyrelsens föreskrifter och allmänna råd om läkemedelshantering i hälso- och sjukvården.* Socialstyrelsen, Stockholm [in Swedish].
SOSFS 2001:17. *Socialstyrelsens föreskrifter om ändring i föreskrifterna och allmänna råden (SOSFS 2000:1) om läkemedelshantering i hälso- och sjukvården.* Socialstyrelsen, Stockholm [in Swedish].
SOU. (1995) *Vårdens svåra val : slutbetänkande av Prioriteringsutredningen (Statens offentliga utredningar ; 1995:5).* Fritze, Stockholm [in Swedish].
Spaite, D. W., Criss, E. A., Valenzuela, T. D. & Guisto, J. (1995) Emergency medical service systems research: problems of the past, challenges of the future. *Annals of Emergency Medicine* **26,** 146-152.

Strömbäck, P. & Kirk, U. (1987) *Räddningen - en bok om första hjälpen*. Bra Böcker, Höganäs [in Swedish].
Suserud, B.-O. (1998). *The role of the nurse in Swedish prehospital emergency care*. [dissertation]. Göteborgs universitet, Göteborg,.
Svedlund, M. & Axelsson, I. (2000) Acute myocardial infarction in middle-aged women: narrations from the patients and their partners during rehabilitation. *Intensive and Critical Care Nursing* **16,** 256-265.
Svedlund, M. & Danielson, E. (2004) Myocardial infarction: narrations by afflicted women and their partners of lived experiences in daily life following an acute myocardial infarction. *Journal of Clinical Nursing* **13,** 438-446.
Söderberg, A., Norberg, A. & Gilje, F. (1996) Meeting tragedy: interviews about situations of ethical difficulty in intensive care. *Intensive and Critical Care Nursing* **12,** 207-217.
Sørlie, V., Jansson, L. & Norberg, A. (2003) The meaning of being in ethically difficult care situations in paediatric care as narrated by female Registered Nurses. *Scandinavian Journal of Caring Sciences* **17,** 285-292.
Sørlie, V., Kihlgren, A. L. & Kihlgren, M. (2004) Meeting ethical challenges in acute care work as narrated by enrolled nurses. *Nursing Ethics* **11,** 179-188.
Sørlie, V., Lindseth, A., Uden, G. & Norberg, A. (2000) Women physicians' narratives about being in ethically difficult care situations in paediatrics. *Nursing Ethics* **7,** 47-62.
Sørlie, V., Melbye, H. & Norberg, A. (1996) International pediatric nursing. Counseling parents of children with acute illness: a task for nurses in an emergency clinic. *Journal of Pediatric Nursing: Nursing Care of Children and Families* **11,** 337-341.
Tanigawa, K. & Tanaka, K. (2006) Emergency medical service systems in Japan: past, present, and future. *Resuscitation* **69,** 365-370.
Thakore, S. & Morrison, W. (2001) A survey of the perceived quality of patient handover by ambulance staff in the resuscitation room. *Emergency Medicine Journal* **18,** 293-296.
Thompson, C. & Dowding, D. (2001) Responding to uncertainty in nursing practice. *International Journal of Nursing Studies* **38,** 609-615.
Timerman, S., Gonzalez, M. M., Zaroni, A. C. & Ramires, J. A. (2006) Emergency medical services: Brazil. *Resuscitation* **70,** 356-359.
Tjora, A. (2000) Menneske og teknologi i kontekst: omsorgsmaskiner i den medisinske nødmeldetjenesten. *Psykologisk tidsskrift - NTNU* (4), 33-37 [in Norwegian].
Torjuul, K. & Sørlie, V. (2006) Nursing is different than medicine: ethical difficulties in the process of care in surgical units. *Journal of Advanced Nursing* **56,** 404-413.
Travelbee, J. (1971) *Interpersonal aspects of nursing*. 2nd ed, Davis, Philadelphia.
Udén, G., Norberg, A., Lindseth, A. & Marhaug, V. (1992) Ethical reasoning in nurses' and physicians' stories about care episodes. *Journal of Advanced Nursing* **17,** 1028-1034.
Wahlberg, A.-C. (2004). *Telephone advice nursing : callers' perceptions, nurses' experience of problems and basis for assessments*. [dissertation]. Karol inst., Stockholm.
Wahlberg, A.-C. (2007) *Sjuksköterskans telefonrådgivning*. Liber, Stockholm [in Swedish].
Wahlberg, A.-C., Cedersund, E. & Wredling, R. (2005) Bases for assessments made by telephone advice nurses. *Journal of Telemedicine and Telecare* **11,** 403-407.

van der Ploeg, E. & Kleber, R. J. (2003) Acute and chronic job stressors among ambulance personnel: predictors of health symptoms. *Occupational and Environmental Medicine* **60** (Suppl 1), i40-46.
Wichowski, H. C. (1994) Professional uncertainty: nurses in the technologically intense arena. *Journal of Advanced Nursing* **19,** 1162-1167.
Wiklund, P. E. (1987) Första hjälpen och ambulanssjukvård - några historiska notiser. *Läkartidningen* **84,** 2429-2433 [in Swedish].
Wilkinson, L. & Pierce, L. (1997) The lived experience of aloneness for older women currently being treated for depression. *Issues in Mental Health Nursing* **18,** 99-111.
Williams, A. & Sibbald, B. (1999) Changing roles and identities in primary health care: exploring a culture of uncertainty. *Journal of Advanced Nursing* **29,** 737-745.
Wiman, E. & Wikblad, K. (2004) Caring and uncaring encounters in nursing in an emergency department. *Journal of Clinical Nursing* **13,** 422-429.
Wireklint Sundström, B. (2005). *Förberedd på att vara oförberedd : en fenomenologisk studie av vårdande bedömning och dess lärande i ambulanssjukvård.* [dissertation]. Växjö Universitet, Växjö [in Swedish].
Zenit. (2006) *Svenskt index för akutmedicinsk larmmottagning. Version 6:06. Nationell upplaga.*
Åhlund, L. (1996) *Vård, mod, makt : att vara och verka i sjukvården.* Kommentus, Stockholm [in Swedish].

Publikationer *i serien* Örebro Studies in Caring Sciences

1. Gustafsson, Margareta (2003) *Konsekvenser av en akut traumatisk handskada. En prospektiv studie av patientens situation under det första året efter olyckan.*
2. Jackson, Karin (2005) *Att vara förälder till ett för tidigt fött barn – en prospektiv studie om upplevelsen av föräldraskap och möten med vården.*
3. Odencrants, Sigrid (2005) *Måltidsrelaterade situationer och näringstillstånd ur patienters med kroniskt obstruktiv lungsjukdom och sjuksköterskors perspektiv.* (Vetenskaplig uppsats)
4. Göransson, Katarina (2005) *Emergency department triage – a challenging task for Swedish emergency nurses.* (Academic essay)
5. Eldh, Ann Catrine (2005) *Patienters upplevelser av och uttryck för fenomenet delaktighet i hälso- och sjukvård.* (Vetenskaplig uppsats)
6. Florin, Jan (2005) *Clinical judgement in nursing – a collaborative effort? Patient participation and nurses' knowledge.* (Academic essay)
7. Ekwall, Ewa (2006) *Women's Experiences of Primary and Recurrent Gynecological Cancer.* (Academic essay)
8. Pettersson, Ingvor (2006) *Significance of Assistive Devices in the Daily Life of Persons with Stroke and Their Spouses*. Dissertation with focus on Occupational Therapy.
9. Carlsson, Eva (2006) *Understanding persons with eating difficulties and communication impairment after stroke – patient experiences and methodological issues in qualitative interviews*. (Academic essay)
10. Göransson, Katarina (2006) *Registered nurse-led emergency department triage: organisation, allocation of acuity ratings and triage decision making.* Dissertation with focus on Nursing.
11. Eldh, Ann Catrine (2006) *Patient participation – what it is and what it is not*. Dissertation with focus on Nursing.
12. Isaksson, Ann-Kristin (2007) *Chronic sorrow and quality of life in patients with multiple sclerosis*. Dissertation with focus on Nursing.
13. Florin, Jan (2007) *Patient participation in clinical decision making in nursing – a collaborative effort between patients and nurses*. Dissertation with focus on Nursing.
14. Johansson, Agneta (2007) *Adolescents' perspective on mental health and health-promoting dialogues*. (Academic essay)
15. Frisk, Margot (2007) *Asthma and respiratory symptoms related to the housing environment.* Dissertation with focus on Occupational Therapy.
16. Forslund, Kerstin (2007) *Challenges in prehospital emergency care – patient, spouse and personnel perspectives*. Dissertation with focus on Nursing.