

Patients with acute hip fractures motivation, effectiveness and costs in two different care systems

LARS-ERIC OLSSON

Institute of Health and Care Sciences
Department of Orthopaedics, Institute of Clinical Sciences
Göteborg University

GÖTEBORG UNIVERSITY



THE SAHLGRENKA ACADEMY
AT GÖTEBORG UNIVERSITY

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Lars-Eric Olsson

From the Institute of Health and Care Sciences and the
Department of Orthopaedics, Institute of Clinical Sciences,
The Sahlgrenska Academy at Göteborg University
Göteborg, Sweden

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To Marie

**Vad många av oss mest av allt behöver,
är någon som får oss att göra vad vi kan.**

Ralph Waldo Emerson

Patients with acute hip fractures – motivation, effectiveness and costs in two different care systems

Lars-Eric Olsson

Institute of Health and Care Sciences, the Sahlgrenska Academy, Göteborg
University, Göteborg, Sweden

Abstract

The care of patients with a hip fracture in Sweden varies a great deal in terms of length of hospital stay and these patients are often subjected to multiple transferrals for other than medical reasons. The way this affects the rehabilitation result is largely unknown, but it is probably not in the best interest of the patients.

The overall aim was to investigate the hospital care for patients with acute hip fractures – their own perceptions of their situation and comparisons of effectiveness and costs using two different care systems. A qualitative method was used to describe the patients' perceptions of their situation after hip fracture surgery. A quasi-experimental design was used to compare the Integrated Care Pathway (ICP) intervention group with a comparison group and a cost-effectiveness method was used for the economic evaluation.

The patients in the qualitative study varied greatly in their engagement in the rehabilitation process, but common traits among all the patients were the need for more information, real worry about future physical ability and a very strong zest for life.

The ICP included a patient-motivated accelerated training programme based on the individual patients' own perceptions and motivation for rehabilitation. The ICP intervention group had a significantly shorter length of hospital stay (12.2 vs. 26.3 days; $p < 0.000$) and the rehabilitation was more successful (36 patients vs. 27 were discharged as low dependent) ($p = 0.003$). Moreover, there was a 40% reduction in the average total cost in the intervention group ($p = 0.000$).

The results suggest that differences in patients' perspectives of the rehabilitation process need to be taken into account to enhance outcomes. It was found to be important to obtain a good knowledge of patients' prerequisites and subject them to accelerated rehabilitation to match their personal ability. The transition theory was intertwined within the ICP, providing help for caregivers when assisting patients to develop new knowledge and skills. The use of an ICP was cost effective and the cost of developing the ICP was covered after just three patients.

Key words: Phenomenography, elderly, cost effectiveness and nursing

This thesis is based on the following papers, which will be referred to in the text by their Roman numerals (I-IV)

- I. Admitted with a hip fracture: patient perceptions of rehabilitation**
Olsson L-E, Nyström AEM, Karlsson J, Ekman I
Journal of Clinical Nursing.
Accepted for publication, 2006

- II. The integrated care pathway reduced the number of hospital days by half: a prospective comparative study of patients with acute hip fracture**
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Journal of Orthopaedic Surgery and Research.
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- III. Prospective comparative study of the effects of nursing interventions within an integrated care pathway**
Olsson L-E, Karlsson J, Ekman I
Journal of Advanced Nursing
Submitted

- IV. Cost of care and health consequences for two different treatments of hip fractures - a cost-effectiveness study**
Olsson L-E, Hansson KE, Ekman I, Karlsson J
Manuscript

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INTRODUCTION

Restoring patients who are treated for a hip fracture to their previous physical functional level is regarded as a realistic goal for health care personnel and society has great expectations when it comes to the independence of elderly people (Thorngren 2002). The increasing number of elderly people who sustain a hip fracture is imposing a heavy burden on the health care system and, for the individual; it is a painful and traumatic experience (Johnell 2005). It is only natural for the patients who sustain a hip fracture to have the will to recover and regain health after this injury, but for many of these patients, in their old age and often medically and socially burdened, their will and motivation may not be strong enough (Kanis *et al.* 2003). From a clinical standpoint, they usually appear to be quiet and humble, unwilling or unable to demand their rights. As they face rehabilitation, our understanding of what this involves their perceptions, awareness or engagement and what is needed for them to accomplish the first phase of the rehabilitation is still not good enough.

The quality of care given to patients with a hip fracture in Sweden probably differs and the average number of hospital care days varies a great deal. At the beginning of the 1990s, the number of hospital care days varied between 10 and 27 days and ten years later it varied between four and 17 days (Thorngren 2002). One reason for this variation could be that patients are transferred between different care facilities, from the orthopaedic department to other kinds of rehabilitation unit, such as geriatric wards, but another reason may be that the actual quality of care is also different. The passive attitude that is often seen among these patients may explain the dissimilar care and the wide-ranging number of hospital care days, but important questions are raised, such as how many hospital care days are needed, what is good quality of care for these patients and how many of them can be restored to their pre-fracture level?

Theoretical framework

Transitions are processes, which occur over time and have a sense of flow and movement (Schumacher *et al.* 1999, Meleis *et al.* 2000). During transitions, new skills, new relationships and new coping strategies need to be developed (Chick and Meleis 1986, Schumacher *et al.* 1999). A transition is a passage between two relatively stable periods of time and is characterised by perception, process, awareness, disconnectedness and process indicators (Schumacher *et al.* 1999). The way an individual perceives the situation determines how the process will continue. Society, culture and closely related groups can influence this perception. Falling and sustaining a hip fracture is a traumatic experience, which for each patient mean a transition from dependence back to, at best, their previous condition. Over the course of such a transition, there is a dynamic tension between healthy and unhealthy processes (Schumacher *et al.* 1999). One example of a healthy process which may start during the hospital stay for patients with a

hip fracture is “redefining meanings”, which takes place when the patients and their relatives are engaged in exploring the meaning of the transition and trying to find new meanings. An unhealthy process is failure to engage in such process. Another example is “developing new knowledge and skills”, i.e. with help of the staff, learning how to use personal aids or inventing their own solutions that can enhance their independence, while an unhealthy process would be resistance to developing such knowledge and skills or insufficient help and support from health providers (Robinson 1999).

Process indicators are measurable indices of how the transition process is proceeding and helpful tools in order to help patients avoid unhealthy transition processes. The hospital period after a hip fracture is extremely important, since the patients easily lose physical skills (Larsson and Rundgren 1997). This means that during hospitalization, indicators of the transition process are most often focused on regaining physical skills as soon as possible after the fracture. Five process indicators can be identified and used in connection with the initial rehabilitation after hip fracture surgery (Schumacher *et al.* 1999). Firstly, and the most important process indicator is the patients’ symptoms since symptoms such as for example pain and fear of using the operated leg are barriers towards a healthy transition process. Symptoms are the patients’ cry for help and they reflect how the condition is experienced. Recognition of symptoms and appreciation of their importance for each individual patient should therefore be the basis for a structured assessment and must be noted carefully because they provide insight into each individual’s pattern of transition from illness to health.

The second most important process indicator is functional status because the patients’ physical recovery should proceed at a reasonably even pace (Latham *et al.* 2006). In order to guide and support this process, the patients’ pre-fracture ability needs to be known and their progress in activities of daily living (ADL) needs to be assessed on a daily basis. An unexpected interruption in the progress suggests an unhealthy transition process and requires attention.

The third process indicator; sense of connectedness to a meaningful interpersonal network is difficult to influence during the hospital stay. The bedside telephone, which is standard today, is one important measure and liberal visiting hours and opportunities to sleep over would be another.

The fourth process indicator is a sense of empowerment. The elderly patient’s sense of autonomy, self-determination, and personal agency is compromised initially after surgery, leading to feelings of being exposed and vulnerable. However, one way of promoting empowerment is to listen to the patients and be sensitive to what they want. This is especially important when the care plan is discussed and goals and intermediate goals are set.

The last process indicator sense of integrity, even if it is difficult to measure during the short hospital stay, includes a sense of wholeness and coherence.

Making the patients realise the progress they are making and commending their efforts is a way to start this process. Another way is to assist them to accomplish goals on the way to independence, such as being able to take care of their personal hygiene and going to the bathroom are important steps, which could start this process.

BACKGROUND

Hip fracture

Hip fracture is the comprehensive term for several fractures of the proximal part of the femur (Thorngren 2002). The two main types are the fractured neck of the femur (the cervical or intra-capsular fracture) and fractures through the muscle attachment distal to the neck of the femur (the trochanteric or extra-capsular fracture). There is a transitional form between these two main types, which is known as a base-cervical fracture. A fracture including the trochanteric part stretching further down the shaft to the distal boundary of the trochanter minor is called a sub-trochanteric fracture (Thorngren 2002) (Figure 1-2). There is a significant difference in healing capacity and the risk of complications between the different types of fracture.

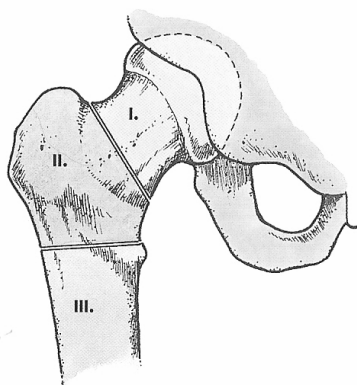


Figure 1.

The anatomical regions of hip fractures

- I. The cervical (intra-capsular) area
- II. The inter-trochanteric area
- III. The sub-trochanteric area

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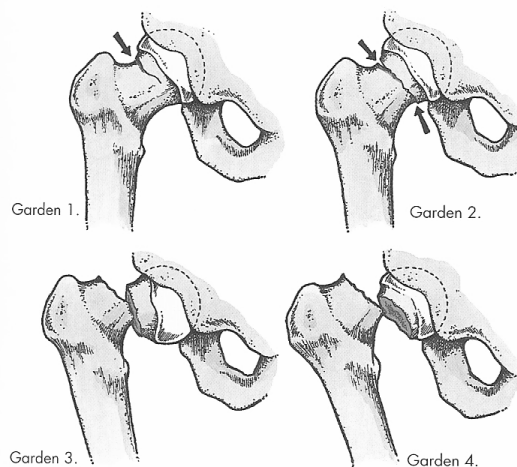


Figure 2.

The four main types of intra-capsular hip fractures (cervical fractures).

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The number of patients sustaining a hip fracture in Sweden is approximately 18,000 a year (Thorngren 2004). The risk of sustaining a hip fracture increases exponentially from the age of fifty, and approximately 90% of the patients are over the age of 65 years and more than half of them are octogenarians (Hedlund 1985, Strömberg 1998). The percentage of women is high, 72%, which is partly a result of the fact that women live longer and partly because of the increasing incidence of osteoporosis among elderly women (Thorngren 2004). Hip fractures are common all over the world, but the incidence is highest in the Scandinavian countries (Thorngren 2004). The number of hip fractures that occur each year in the world has been estimated by Cooper *et al.* (1992) to be 1.66 million in 1990

and is predicted to rise to 6.26 million by the year 2050, which correlates to an annual increase of 6.2%.

It is well known that patients who are treated for an acute hip fracture have high morbidity and often lose a vital part of their quality of life due to the fracture (Cooper *et al.* 1997, Johnell and Kanis 2005). Sernbo and Johnell (1993) reported that only 50% regained their pre-fracture status as judged by the ability to walk and the need for aids at home. Mortality after hip fracture is also known to be high, although the excess mortality may be partly due to co-morbidity (Johnell and Kanis 2004). Kanis *et al.* (2004) made an analysis of the Swedish population which suggests that approximately 25% of deaths associated with the hip fracture are causally related to the hip fracture event. There are significant differences in mortality between the sexes, 13.8% of the women have died at four months, compared with 22.9% of the men. The mortality increases gradually during this period, but it is higher for men at all times (Thorngren 2004).

Patients treated for an acute hip fracture represent the largest single disease group at the orthopaedic department and they consume approximately 25% of the total number of care days in Swedish hospitals (Thorngren 2004). The cost of hip fractures to society is also very high. It has been estimated that the average cost is about USD 21,000 (Johnell 1997) for the first year, with an increased cost for the following years. The cost of hip fracture treatment worldwide was estimated to be USD 34,800 billion in 1990 and it is expected to rise to USD 131,500 billion in 2050 (Johnell 1997).

Being old and vulnerable

The number of old people is increasing in Sweden and, in 2025, it is estimated that 20% of the population will be 65 years or older (SCB 1997). As people grow old, they are exposed to many different vicissitudes of life. Many have experienced different adjustments or losses in their later life, such as deteriorating health, changes of residence or retirement (Bank 1995). The way the changes and losses during the human life cycle are interpreted is influenced by the socio-cultural conditions within which ageing takes place (Öberg 1997). According to the national health and welfare board (*SOSFS* 1996:24), good health care should be available to everyone according to their needs and patients should take part in both the planning and decisions relating to their treatment and care. The way in which elderly people perceive their needs when starting their rehabilitation after major surgical treatment has so far not been explored. There are retrospective studies investigating how patients treated for an acute hip fracture perceived the hospital care and the home-coming period (Robinson 1999, Archibald 2003). The results of both studies were in agreement in two areas; the experience of sustaining a hip fracture was a major trauma where the patients felt their future independence was threatened and the pain relief was considered to be insufficient

(Robinson 1999, Archibald 2003). The informants in both studies stated that it was difficult to recall how they felt and what it was like. The time the elderly are kept immobilised is more important than is usually realised. An octogenarian loses 1-3% of his/her muscle strength every day when immobilised. It is therefore important to remember that they already have to use 70-80% of their muscle power to get out of bed (Larsson and Rundgren 1997). The margin of physical strength is low, so a lost skill for the elderly could therefore be difficult or perhaps impossible to recover. From this perspective, rapid admission and surgery would consume less of the existing physical power margin the elderly patients have.

The standard care

During the last decade, increasing collaboration has developed between the orthopaedic and geriatric wards in rehabilitating patients undergoing surgery for a hip fracture. The motives behind this may be multiple, but the main reason is perhaps the increasing number of patients who a small clinic like the orthopaedic department has difficulty handling. However, even if the collaboration is good in some ways, it has also led to a variety of care systems and some patients being transferred from one clinic to another for other than medical reasons. This means that they can be cared for at the orthopaedic department, geriatric department, or a community care facility. In reality, they can be transferred from orthopaedic department to the geriatric department to a community facility and then perhaps to their homes and these different care systems are probably often not in the best interest of the patients. In a Swedish study, it was reported that the number of days in care was in fact increased when the patients were transferred instead of being rehabilitated at the primary ward (Strömberg 1999). At a national conference in the USA, a consensus was reached that transferrals, during the first part of the rehabilitation, increased the number of days in care (Morris and Zuckerman 2002).

Data from the Swedish quality inventory “Rikshöft”, which is available from the National Board of Health and Welfare, indicate the current status of the treatment of patients with an acute hip fracture (Thorngren 2004). The inventory is currently nationwide, most hospitals participate and a brief summary of some of the results from standard care are as follows:

The patient group consisted of 72% women and 28% men, the average age was 84 years and 49% of them were living alone. The average waiting time to operation was 1.2 days. The number of days the patients spend in acute hospital care continues to decline and the average time is now less than 10 days, with a range of between four and 17 days. Around 60% of the patients were living in their private homes before the fracture and 23% were discharged directly back to their private homes from the hospital, while 37% were transferred to a rehabilitation unit. After four months, 56% of the patients were back in their

private homes again. Before the fracture, around 60% were able to walk alone outdoors, 10% were able to walk outdoors with someone and 3% were unable to walk. At four months, 36% were able to walk alone outdoors, 12% were able to walk outdoors with someone and 12% were unable to walk. Before the fracture, 43% were able to walk without any walking aid and 43% used a walking frame. At four months, 16% were able to walk without any walking aid and 58% used a walking frame, while almost 60% reported varying degrees of pain from the hip.

The aim for health care is to restore patients who have sustained a hip fracture to their former physical functional level (Thorngren 2004), a goal 50%-75% of them never reach (Egan *et al.* 1992, Marottoli *et al.* 1992, Sernbo and Johnell 1993, Strömberg 1998), and Swedish patients are no exception. The reason why so many patients never regain their pre-fracture level of physical function may be that the quality of care is too low. In order to use the existing resources and ensure that each patient receives optimal care, it appears to be necessary to use the individual patient's need for care as the starting point. It is still not common practice to perform systematic evaluations of the individual patient's need for care and this probably increases the risk of serious misjudgements and may also explain why so many patients never return to their pre-fracture functional level.

Assessment of elderly patients

The assessment of an elderly patients' health, which involves functional status, activities of daily living, mental status and emotional well-being, is a starting point for both further planning and outcome criteria in the nursing care process. Assessment has been defined as the first step in the nursing process and consists of receiving and gathering data about the person's need for nursing care (Ashworth *et al.* 1987). A correct assessment is a vital part of the process of meeting the criteria for high-quality care and provides a comprehensive picture of the patient (Nikolaus *et al.* 1999). Obviously knowledge about personal factors as well as the individual's perception and ideas of the source of the symptom is important when assessing symptoms (Ekman *et al.* 2005a) The art of measuring a person's functional status and symptoms are considered to be difficult and related to problems since symptoms are subjective experiences that changes over time and between individuals (Ekman *et al.* 2005a).

However, the patient's own assessment of the degree of the severity of his/her symptoms predicts mortality and hospital care for up to five years (Ekman *et al.* 2005b). At the same time, it has also been shown that the assessment of patient symptoms is not given high priority by nurses (Ehrenberg *et al.* 2004). For this reason, in-depth and future development of the knowledge of the patient's perception of his/her condition and symptoms could improve the base for planning care and rehabilitation.

The complex relationship between the social, biological and psychological variables which influence a person's functional abilities and well-being has been emphasised in earlier studies and has been discussed in the light of daily living (Henriksson 1995, Öberg 1996). An assessment of functional state provides essential information, which might assist in the maintenance or restoration of self-care activities. For this reason, nurses need to assess the ability of a patient to perform activities of daily living (ADL) in the context of the patient's baseline functional state, as well as the current status (Johansson 1998). The assessment of dependence in ADL is of great importance as point of departure for care planning as well as in the discharge planning process. It is helpful in the descriptions, evaluations and predictions, although they do not tell us why a person has limitations in ADL or how dependence is experienced (Sonn 1995). Functional status is probably the single most important area of personal function, because it is linked to mental and physical health, as well as social well-being. Perceptions of health in the elderly are often associated with the level of functional ability. Self-care ability among the elderly is reinforced by physical activity and by the development of self-awareness (Söderhamn 1998). Changes in health status involve a process of transition (Meleis *et al.* 2000). Recovering from a hip fracture is one such transition, turning elderly independent people into vulnerable dependent patients who then struggle to regain their well-being and pre-fracture function. The rehabilitation after a hip fracture requires a major effort from the patients, where their former independence is often transformed into dependence (Egan *et al.* 1992, Marottoli *et al.* 1992, Morris and Zuckerman 2002). Salkeld *et al.* (2000) found that any loss of ability to live independently in the community has a considerable detrimental effect on people's perceived quality of life. The responsibility rests heavily on the hospital organisation not to keep patients immobilised for too long because they will inevitably lose some of their physical skills, which may be difficult or even impossible to recover at a later stage during the rehabilitation process (Larsson and Rundgren 1997).

A knowledge of patients' pre-fracture ability to function in daily life activities is the key to accurate care planning at admission and to evaluations of the progress of the rehabilitation during discharge care planning (Styrborn 1995). However, the instruments used for this purpose have to cover many vital factors to capture the needs, health and quality of care aspects of the elderly (Johansson 1998). In this sense, it is essential to find a package of reliable and valid assessment instruments, which can identify the unique individual and follow his/her condition during the rehabilitation phase. However, it is not enough simply to find and develop these instruments; it is most important to use them in a non-mechanical way with respect to the non-measurable parts of care (Johansson 1998). The organisation of the care needs to be arranged so that assessments of health and function with well-tested instruments form the basis of the nursing procedures including documentation of the results, with the overall aim of

promoting quality patient care (Johansson 1998). This could also result in a more cost-effective practice.

Quality in the health care organisation

The hospital organisation is important in view of the fact that it has such a great impact on the outcome. When stricken by a major accident such as sustaining a hip fracture, there is no opportunity to choose which hospital to consult. As a result, great responsibility rests on the hospital organisations to provide not only good quality medical treatment but also high-quality care, which is most likely to preserve the patient's pre-fracture ability to a high degree.

Escalating health care costs and budget restrictions have made it necessary for the health care industry to provide more cost-effective services without compromising the quality of care provided. The implementation of measures to help control cost and resource utilisation has frequently resulted in shorter hospital stays (Zander 1993). One cost-effective measure employed by many hospitals, mainly in English-speaking countries, is the use of integrated care pathways (ICP). Since the implementation of ICPs in the 1980s, the use of this tool has continuously increased as a result of efforts to control resource utilisation (Rumble *et al.* 1996). ICP addresses all three important domains, which were described by Donabedian (1966) in his model; *structure* (characteristics of the care providers, their tools and resources and the physical/organisational setting); *process* (both interpersonal and technical aspects of the treatment process); and *outcome* (change in the patient's symptoms and function).

ICPs have been described for more than 45 conditions/procedures (Campbell *et al.* 1998), including hip and knee replacement surgery, as well as hip fractures. ICPs are proposed as a means of providing high-quality care in a timely, cost-effective manner (Rumble *et al.* 1996, Zander 1998, Dowsey *et al.* 1999). The method aims to describe and develop the course of events, in as much detail as possible, for a group of patients with a defined condition. ICPs acknowledge individual variations within the patient group, but they are only intended to cover 75 per cent of the patients with the given condition (Walsh 1997, Cheater 1996). The ICP defines an optimal sequencing and timing of interventions by physicians, nurses and other care-givers and is designed to better utilise resources, maximise quality of care and minimise delays (Coffey *et al.* 1992). The care path is standardised, but, during the care process, it is tailored to suit each individual patient's needs and resources. It describes a course of events, which are expected to lead patients to pre-defined goals (Crummer and Carter 1993). The ICP is developed by an experienced multidisciplinary team that represents all the vocational groups and departments who care for the patients with the particular condition. The team creates a very detailed care map, identifying all the important parts of the care, by deciding what to do, who is to

do it and when. The aim is to develop a care path with the highest possible evidenced based standard, adapted to match the local hospital's prerequisites. All the team members keep their colleagues informed about the work and its progress, asking for views and opinions in order to make them feel involved. This way of developing the care path is believed to be the most important factor in the success of the ICP (Crummer and Carter 1993). As a result of the predetermined nature of the care path, the distribution of responsibility is clearly visible. The multidisciplinary approach to care leads to consensus among the members of the health care team, thereby promoting care, which is based on the patient's response (Rumble et al. 1996). The method also emphasises active participation from the patients and their relatives, by formulating intermediate and long-term goals, for example, as well as certain care actions and evaluation of the care. Each member of the team is responsible for ensuring that the actions specified in the care path are also implemented. The documentation is usually restricted to a signature, as long as the care is uncomplicated and the patient follows the ICP. Further documentation is needed to better understand when a patient deviates from the care path. In that situation, the variation is described, together with the actions and results (Petryshen and Petryshen 1992).

Variances are deviations from the ICP, avoidable or unavoidable, and could be caused by the patient or family, caregiver/clinician, hospital/system, or the community. Variations can be both positive and negative. Positive variations are usually activities or a goal reached ahead of time and do not need to be analysed in any further detail (Hampton 1993). Negative variations often increase the risk of a prolonged hospital stay and require a documented analysis (Coffey *et al.* 1992).

Rationale of the study

The rationale of this study was to investigate how to safeguard patients who had been admitted for a hip fracture. Moreover, the prerequisites for rehabilitation in a structured, systematic form during the hospital stay were studied. In many cases, the elderly patients who sustain a hip fracture are already burdened, which makes it difficult to know how and at what pace the rehabilitation can be performed. In order to investigate the new care system, it was decided that the intervention was to be analysed from several angles. The actual idea behind the intervention was that each patient's resources and obstacles for an accelerated rehabilitation would be identified through their history and would be the point of departure for the care plan. The rehabilitation was therefore supposed to be based on the individual patient's own perceptions of the situation. If the patient, for example, declared a lack of motivation, it would have to be addressed first. Recovering from a hip fracture is a transition from dependence and hospitalisation to struggling to regain the pre-fracture functional level. The rehabilitation of these conditions generates a process of transition that requires a

major effort from the patients. As a result, perceptions, knowledge, motivation, awareness and engagement are important ingredients that can diverge among these patients, but there may nonetheless be predominant perceptions (Study I). The care of the elderly patients who sustain a hip fracture is complex and several care providers from different professions are involved. In addition to the patients' motivation, the care of patients with a hip fracture requires a team approach, where the co-ordination between the different parts of the care is important. When developing the intervention, it was important for all the vocational groups to be represented in order to make the ICP realistic, of high quality and to facilitate the co-ordination between the different departments (Study II). The nurses play an important role in the care of these patients; they are present during the whole hospital stay, regularly making assessments of different kinds. The nurses' role and their means of contributing to the successful rehabilitation of patients undergoing surgery for a hip fracture is not at all clear. However, the nurses' role in the rehabilitation team has been described as containing six functions; *assessment, emotional support and involving the family, co-ordination and communication, technical and physical care, therapy integration and carry on* (referring to prescribed therapy and utilising new abilities). For this reason, it was important to investigate the need for the nurses to work effectively within the multi-professional team (Study III). The economic impact of treating patients with a hip fracture is known to be large and to be steadily growing. Hip fracture patients are a large group consuming approximately 25% of the total number of care days at Swedish orthopaedic departments. The rehabilitation of a patient with a hip fracture comprises training, not only at the hospital but usually also additional help and training from community care. For both human and economic reasons, it is important for hospitals to provide care methods, which can preserve as much as possible of the elderly patients' physical function and independent living. It is a challenge to provide high-quality care, which, at the same time, uses the smallest possible amount of economic resources (Study IV).

AIMS OF THE STUDY

The overall aim was to investigate the hospital care given to patients with an acute hip fracture – a study of their own perceptions of their situation, comparing effectiveness and costs in two different care systems.

Specific aims

- Study I: To describe the patients' own perceptions of their situation and views of their responsibility during the rehabilitation process.
- Study II: To evaluate the effectiveness of an integrated care pathway in patients with an acute fracture of the hip.
- Study III: To evaluate the contribution owing to nursing care within in the integrated care pathway.
- Study IV: To compare costs from the integrated care pathway intervention group with standard care in patients with acute hip fractures.

METHODS AND PATIENTS

Research methodology perspective

Qualitative methods are particularly appropriate when it comes to obtaining a fuller understanding of what constitutes reality for patients in a special situation. On the one hand, research questions can relate to the appearance of reality and why it appears that way. In such studies, different biological variables such as muscle strength, ability to walk or to carry out daily activities are measured; this can be seen as an outside perspective. On the other hand, the research questions can be based on the way people perceive or think about this reality. Perceptions reflect the patient's personal experience, the distinction reflects the difference between "what something is" and "how something is perceived to be", and questions of the latter type can be regarded as reflecting an inside perspective. In the present thesis, both perspectives have been used; the inside perspective was used to describe the patients' perceptions as they are about to start the rehabilitation. The inside perspective guided the intervention from the individual patient's perspective with his or her unique experiences, context and resources aiming to regain well-being and health.

The outside perspective was intertwined in the intervention by using knowledge from evidence-based research such as standardised measurements and measuring the outcome of the intervention.

Phenomenographic method

The qualitative method, phenomenography, which was used in the first study, was developed at the Department of Education and Educational Research at Göteborg University (Larsson 1986, Marton 1981). The aim of phenomenography is to find and systematise forms of thoughts in terms of how people interpret aspects of reality; aspects which are at least supposed to be shared by a particular group of people; such as patients with a hip fracture (Marton 1981). The method has its roots in learning research, but it has also been used to analyse people's perceptions of, or thoughts about, more general phenomena in the world around them. The common interest of phenomenographic research is first and foremost that people have different conceptions of phenomena and objects in the world. Differences in conceptions could be explained by the fact that different people have different experiences as they have different relations to the world. People then perform different analyses and obtain different knowledge about these phenomena or objects. When qualitative data in the form of interviews are used in phenomenography, they are analysed for the characteristics of their meanings in relation to the specific topics focused on during the interview. All the interviews are then compared with each other in terms of their differences and similarities. Those who describe similar conceptions of the phenomena in focus are categorised into qualitatively different categories of description. The research interest in phenomenography is to

describe these differences, i.e. variations in the conceptions as the result (Alexandersson 1994). The major outcome is thus a framework of different categories, which, in their presentation, are named, described and illustrated with representative quotations from the interviews. Within this research approach, the conception on the collective level and not the individual conception is the main area of interest.

Analysis

The analytical process starts by making oneself familiar with the data material by continuous perusals, until the criteria of familiarity are met. The purpose of this is twofold; firstly, the researcher must study the material in order to increase his/her sensitivity to what is being expressed in the text (Wenestam 2000). Secondly, the researcher must acquire a feeling for variations in and the limitations of the data material by searching for statements to reveal qualitative differences in the informants' way of conceiving the phenomenon (Alexandersson 1994). The next step is to look more closely for the meaning each subject gives to the phenomenon. The informants' way of perceiving or experiencing the phenomenon should be carefully observed in a concrete and systematic way to identify differences and similarities in the statements, which can be done by contrasting the interview statements against each other. During the analysis, the whole picture needs to be identified first and the analysis then continues by describing individual parts. The following steps are intended to put the verbal descriptions together to produce a comprehensive description of conceptions found in the data, which are being analysed. These descriptions should be interesting in relation to the phenomenon, but they should also differ from each other in a distinct and qualitatively different way (Alexandersson 1994). In phenomenographic research, the main result constitutes the "outcome space" and the final phase of the method is to study the underlying structure in the category system. The different conceptions that have been found make up the meaning variation in the data material and constitute the qualitatively different conceptions of the phenomenon, which is centred on in the data material (Wenestam 2000).

Reliability

Issues relating to study results in terms of reliability, accuracy and validity apply to all kinds of research. In phenomenography, the questions of reliability, accuracy and validity relate to the degree to which the obtained categories of description represent the informant's conceptions (Alexandersson 1994). Since the results of phenomenographic research can be regarded as a discovery, the meaning of the concept of reliability has been interpreted as the degree to which an outsider can identify the categories of descriptions. In phenomenography, different actions have been developed to meet the demand for reliability. First of all, significant quotations are used to establish the obtained categories of description and, by doing this, it is possible to follow the researcher's standpoints

and evaluate how reasonable they are. Secondly, a co-judge could be used to categorise the quotations and then compare the degree to which they correspond.

Quasi-experimental method

The purpose of quasi-experimental and experimental designs is to examine causality. The power of the design to accomplish this purpose is dependent on the degree to which the actual effects of the experimental treatment (the independent variable) can be detected by the measurement of the dependent variable. Obtaining an understanding of the true effects of an experimental treatment requires actions to control threats to the validity of the findings. Threats to validity are controlled through the selection of subjects, control of the environment, planning of the treatment and reliable and valid measurements of the dependent variable (Burns and Grove 1997). Research using a quasi-experimental design often resembles an experiment. However, quasi-experimental designs lack at least one of the other two properties that characterise true experiments, i.e. randomisation or a control group. The basic difficulty with the quasi-experimental approach is its weakness, relative to experiments, in allowing us to make causal inferences. Although quasi-experiments lack some of the controlling properties inherent in true experiments, the hallmark of the quasi-experimental approach is the effort to introduce other controls to compensate for the absence of randomisation or control group components (Polit and Hungler 1995). Quasi-experimental designs were developed to provide alternate means for examining causality in situations that are not conducive to experimental controls. The quasi-experimental designs facilitate the search for knowledge and the examination of causality in situations in which complete control is not possible (Burns and Grove 1997).

Cost-effectiveness method

The cost of treating patients with hip fractures affects both the hospitals and the communities. The level to which patients are restored at discharge could affect the cost to the community, i.e. if patients are discharged prematurely, there is no true cost reduction, merely a shift in the cost. The data for the present study emanate from the hospital care alone. It was assumed that, if the condition of the patients in the intervention group was equal or better, compared with the comparison group, and if they returned to their previous living to the same extent, the costs after discharge would be equal. A positive result for the intervention group would therefore not represent a shift in costs from hospital health care to community health care but would instead be a true gain in terms of health and cost. This enabled the cost analysis to be calculated from the hospital perspective.

Costs and health measures

Health evaluations

Evaluating a new treatment method which involves the whole care organisation includes evaluations of three different measures. The most important measure is the effectiveness, but the cost of the health care treatment and the cost of developing the new care organisation are also of major importance. There are four main methods for making economic evaluations in health care, two of which were considered for use in the present study; the cost-minimisation analysis and the cost-effectiveness analysis (CEA). The cost-minimisation analysis compares treatments solely on the basis of costs and the outcomes therefore have to be identical (Drummond *et al.* 1997, Kobelt 2002, Folland *et al.* 2004). The health consequences were believed not to be identical, making the CEA preferable.

Costs

The study was designed from a hospital perspective; i.e. only direct hospital health care costs were studied. Direct non-medical costs; i.e. costs generated from relatives, were not studied. Indirect costs were not calculated due to the study members' high average age (mean 84 years), suggesting that no loss of income or fall in production occurred. The costs were studied using a bottom-up methodology; i.e. costs were collected directly from a patient sample prospectively for a given time, but were not discounted owing to the short study period (Drummond *et al.* 1997, Kobelt 2002). All costs were actual and covered all in-hospital expenses and they were retrieved from the hospital's financial database where all the monetary data from each individual patient were available. The database made it possible not only to retrieve the total treatment cost but also to calculate the costs for different parts of the care. The hospital's cost is made up of hotel costs, such as health care, drugs, housing and so on, and treatment costs, such as investigations and surgery (Table 1). A large part of the hotel cost is usually the cost of staff. However, the number of staff in the present study was kept similar in both groups throughout the study period, which meant that the hotel cost also was similar in both groups. In addition to the cost of care, the cost of developing the ICP was also calculated. All the costs are given at 2004 rates and they were then converted from Swedish crowns (SEK) to euros (€) using the annual average exchange rate for 2004 (9.1268 SEK/€) (Sveriges Riksbank 2006).

Table 1 *Hospital costs*

HOTEL COST¹	COST PER BED DAY (€)
Clinic:	
Orthopaedic ward	592
Geriatric ward	438
TREATMENT COST²	COST PER UNIT (€)
Radiology: (x-ray examinations)	
Hip	62.8
Lung	87.3
Clinical physiology	
UCG	350.6
Chemistry	
Routine blood test*	19.9
Microbiology	
Urine C/S	9.6
Blood C/S	20.6
Haematology	
Blood grouping	31.6
Unit of blood	94.4
Theatre	20.7/ minute
Postop. and recovery	42.6/ hour

¹*Hotel cost includes cost of housing, food, drugs, health care and administration*

²*Costs for radiology, chemistry, haematology, theatre and post-op relate to all patients. Urine C/S was frequent. UCG, and blood C/S was less frequent.*

* Na^+ , K^+ , *Crea*, *Hb*, *LPC*, *PK*, *APTT*,

Effectiveness

Physical function was measured by the patients' level of activities of daily living (ADL) (Katz *et al.* 1963). The ADL index is a construed scale with hierarchical steps from A-G, where A is independent and G is dependent in personal daily activities. The present study applied to a hospital perspective and the outcome was to be presented within that perspective in such a way that successful cases could be defined. For this purpose, the Katz ADL index was used as a tool to assign the patients to either a high-dependent group (ADL level D-G) or a low-dependent group (ADL level A-C). The basis for this reasoning is that the low-dependent patients have a limited need for help and they could continue recuperating in their own homes, living independently, assisted by home help or a significant other (Robinson 1999, Curry-Cox *et al.* 2003).

Cost-effectiveness analysis

In cost-effective analyses, differences in both costs and effects are compared between two or more interventions. The two different treatments in the present study were treatment A (ICP intervention group), and treatment B (standard care group). The two treatments were to be compared with regard to costs and effects, $\frac{\text{cost A}}{\text{effect A}}$ vs. $\frac{\text{cost B}}{\text{effect B}}$, which could yield four different possibilities (Fig. 3). If the result turned out to be the same as in the first two quadrants (Q) Q1 and Q2, it was considered unsuccessful, because the intervention treatment was less effective and the cost then becomes irrelevant. If the result turned out to be the same as in the last two quadrants, Q3 and Q4, it was considered successful, because the intervention treatment is more effective and it then becomes a matter of cost.

Figure 3 The four different outcome possibilities for cost-effectiveness (Borgström 2006).

Treatment A costs more than treatment B and is less effective	<i>Q1</i>	Treatment A costs more than treatment B and is more effective	<i>Q3</i>
	<i>Q2</i>		<i>Q4</i>
Treatment A costs less than treatment B and is less effective		Treatment A costs less than treatment B and is more effective	

Developing the ICP

The ICP was developed by an experienced multidisciplinary team that represented all the vocational groups and departments that cared for the patients with a hip fracture. The development of the ICP continued over a period of almost four months and the team consisted of twelve persons, four registered nurses including the project leader, three staff nurses, two physical therapists, one occupational therapist, one orthopaedic surgeon and a hospital welfare officer. The group met every week in different constellations; on average five persons participated and the whole group only got together once. The reason for this was the difficulty involved in co-ordinating free time for the group members, but working in this way was still found to be effective. Nineteen meetings were scheduled; two were cancelled and the project leader spent 28 hours a week on the project. Some costs, such as the physicians' costs, were not possible to measure, as most of the work was carried out using e-mail and brief discussions on the ward in connection with rounds (Table 2). Other costs, such as discussions within each vocational group, were not possible to measure either. Before implementing the ICP on the orthopaedic ward, a two-hour course of training was offered to the staff at the orthopaedic department.

Table 2 *Hourly costs*

Vocational group	Cost per hour* (€)
Registered nurses	24.8
Enrolled nurses	20.7
Physiotherapists	23.1
Occupational therapists	23.4
Hospital welfare officer	24.1
Physician	50.2

**Average hourly costs for each vocational group 2004 in Sweden including social fees*

Statistical methods

Sample size; Studies II, III and IV

The sample size calculation was based on a previous audit of the hospitals' records (Källström 2000). It was estimated that 53 patients would be required in each group to achieve 80% power for detecting an eight-day reduction in length of hospital stay at a significance level of $p < 0.05$. Parametric data were analysed using Student's t-test for independent groups and non-parametric data were analysed using Fisher's exact test and chi-square, p-values of < 0.05 were regarded as statistically significant. Correlations were analysed using Pearson's product-moment correlation. The costs were calculated using Student's t-test for independent groups, 95% confidence interval, to compare means between the comparison group and the intervention group.

Patient selection

Table 3 *Study table*

	Analysis	N
Study I	Phenomenography	13
Study II – IV comparison group	Quasi-experimental	56*
Study II – IV intervention group		56
Study IV	Cost-effectiveness	
	Total	125

* Three patients died during the hospital care

Study I

The phenomenographic method does not claim that the results can be generalised and, as there is no demand for representativeness, the selection can be strategic. The informants were recruited from a geriatric/orthopaedic department. The

inclusion criteria were being aged 70 years or more, non-institutional residence and undergoing acute surgery for a hip fracture. The exclusion criteria were severe illness, cognitive impairment or dementia, or pathological fracture. Thirteen patients were strategically selected. Two men and eleven women, aged 71–93 years (median 81 years), met the inclusion criteria and were invited by their primary nurse to participate in the study. They were provided with both verbal and written explanations of the study and they were assured that participation was voluntary and that the data would be treated confidentially. Informed consent was obtained and all 13 patients agreed to participate.

Studies II, III and IV

The inclusion criteria were that the patients should be living independently, including service flats, be ambulatory (with or without assistive devices), be 65 years or older and be admitted to the hospital with an acute hip fracture. Patients fulfilling these criteria were consecutively selected. The exclusion criteria were pathological fracture, living in a nursing home and severe intellectual impairments according to Pfeiffer's test (<3 points) (Pfeiffer 1975). Approximately 35% of the patients in each group were excluded because of a low test score. The comparison group comprised 56 consecutive patients admitted to the hospital between October 2003 and March 2004. The ICP was subsequently developed by a multidisciplinary team representing all the involved vocational groups and departments. All the relevant personnel received training and a written manual was available to all staff. After implementation, the ICP was constantly monitored by the researcher. No trial period was used and data were collected from 56 consecutive patients in the intervention group between October 2004 and March 2005. The patients received both oral and written information about the study at admission and informed consent was obtained from each patient. All the eligible patients agreed to participate in the study. Three patients in the comparison group died before discharge from hospital.

Data collection

Study I

The common method of data collection in phenomenography is the semi-structured interview (Alexandersson 1994). The interviews were conducted in the informants' room or in a secluded area of the ward as soon after the operation as the informants felt strong enough, in order to obtain the patients' personal perceptions. Each interview lasted 30-45 minutes and was recorded and subsequently transcribed verbatim by the researcher. The interviews took the form of a dialogue and were semi-structured, such that the main questions, which related to the informants' perception of the transitional properties, were included in all interviews. This form of interview is characterised by a combination of open questions and attendant questions from a pre-made question guide (Kvale 1997). During the interviews, deliberate efforts were made to encourage the

informants freely to reveal and comment on their personal experiences of and reflections on their situation, without imposing the interviewer's own values on what was being said.

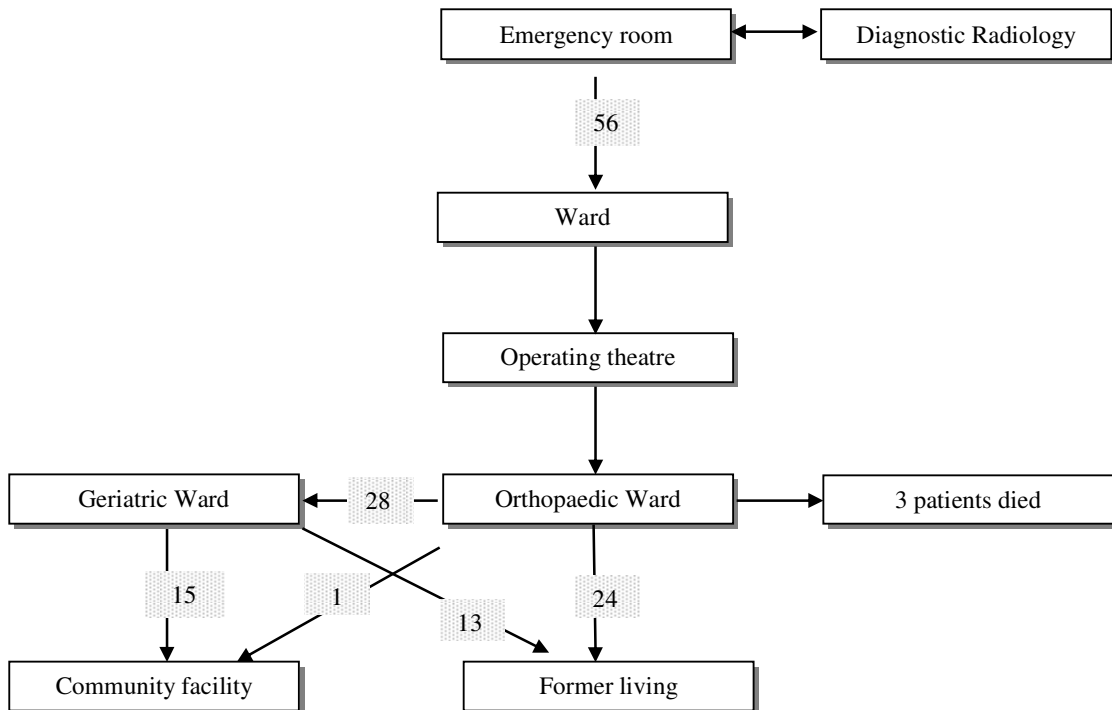
The analysis proceeded in accordance with the method and the transcripts were perused several times to enable the researcher to become familiar with the data and to form an impression of the material as a whole. They were then analysed to determine the patients' perceptions of the five transitional properties and meaning units relevant to the study were identified and pooled. A total of 542 meaning units could be identified and a saturation of conceptions was observed when nine interviews had been analysed. These meaning units were then read and compared with each other. In the next step, meaning units describing qualitatively similar conceptions were grouped together and the nature of this similarity was articulated. This grouping resulted in a limited number of categories of description. These categories were labelled in accordance with their characteristics and exemplified by representative quotations from the interviews. In order to test the reliability of the categories, they were examined by a co-judge, who had access to the descriptions of the categories and to the interviews but not to information about the category to which the different interviews belonged. The co-judge's task was to categorise the interviews based on descriptions of the categories. The examiners both agreed on the categorisation in most cases and, after a few adjustments, their judgments matched.

Studies II, III and IV

To meet the criteria for a quasi-experimental study and minimise threats to the validity, a comparison group was used. This group represented the standard care (Polit and Hungler 1995, Burns and Grove 1997). To control for diversities between the ICP-guided intervention group and the comparison group, their pre-fracture function was investigated and described. On arrival at the ward, all the patients were interviewed by a nurse who gathered demographic information such as age, social status and type of living. The patients' apprehension of their condition and physical function was investigated. The nurse also asked about and registered former and present health problems. If the nurses were uncertain of the patients' answers or if the patients were unable to provide all details required, admission data were checked with a relative or the previous caregiver. The physician who admitted the patient asked about co-morbidities and drugs. The physiotherapists mobilised the patients once a day on weekdays and were responsible for trying out and providing walking aids. The occupational therapists were responsible for trying out and providing assistive devices. At discharge, the patients' dependence on walking aids and gait capacity was measured in order to confirm the patients' physical function when leaving the hospital. Standard care comprised a transferral system, by which the patients could be transferred to a geriatric department at the hospital in order to facilitate the post-operative rehabilitation. Decisions relating to transfers were made within the first few days

after admission, by an orthopaedic surgeon, and a total of 28 patients were transferred (Figure 4).

Figure 4 Clinical trajectory of care in the comparison group.



Assessments

All the patients were assessed by a nurse upon arrival at the orthopaedic ward and their pre-fracture physical function, medical and mental status were measured. The assessment was performed using instruments, which have previously been tested, validated and frequently used in patients with a hip fracture. The patients' level of independence prior to the hip fracture was measured using the Functional Recovery Scale (FRS) (Zuckerman *et al.* 2000 a,b). The FRS comprises measurements of the patients' independence in four basic activities, six instrumental activities and mobility (Table 4).

Table 4 *Functional Recovery Scale*

		Score impact
Basic activities	Dressing, toileting, feeding and bathing	44%
Instrumental activities	Food shopping, food preparation, finance, transportation, house work and laundry	23%
Mobility	Level of walking ability	33%

(Zuckerman *et al.* 2000 a,b).

General medical condition prior to the hip fracture was classified in three categories according to the Ceder scale (Ceder *et al.* 1980). The assessment was made on arrival at the ward and was based on statements from the patient/relative, medical information available at this point and the nurse's observation (Table 5).

Table 5 *General medical condition scale*

A	No other injury or illness
B	No other injury or illness that might impede rehabilitation
C	Other injury or illness that might impede rehabilitation

(Ceder *et al.* 1980)

Cognitive impairment, which may include dementia, psychosis and delirium, as well as numerous others psychiatric diagnoses, was assessed with the Short Portable Mental Status Questionnaire (SPMSQ) (Pfeiffer 1975), a ten-item rating scale (Table 6). The scale has been slightly modified for use in Sweden, as the term "president" in items 7 and 8 was replaced by "prime minister". The initial assessment was made on arrival at the ward and further measurements were made on day six and at discharge from the orthopaedic ward.

Table 6 *Short Portable Mental Status Questionnaire (SPMSQ)*

1	What is the date today?
2	What day of the week is it?
3	What is the name of this place?
4	What is your telephone number alt. street address?
5	How old are you?
6	When were you born?
7	Who is the prime minister now?
8	Who was prime minister before him?
9	What was your mother's maiden name? *
10	Subtract 3 from 20 and keep subtracting 3 from each new number, all the way down.

* A female first name plus a last name other than the subjects last name will do

(Pfeiffer 1975)

The patients' ADL level was graded essentially according to Katz *et al.* (1963) (Table 7). The pre-fracture ADL level was estimated by the orthopaedic ward nurse at the arrival interview with the patients and accompanying relatives and/or checked with the previous caregiver. During the hospital stay, ADL was measured daily by the caregivers assigned to the patient. Assessments made at admission to the ward regarding pre-fracture abilities (baseline statistics) and assessments made at discharge were used for all evaluations.

Table 7 *The modified Katz ADL index score*

A	Independent in all functions below
B	Dependent in bathing
C	Dependent in bathing and dressing
D	Dependent in bathing, dressing and toileting
E	Dependent in bathing, dressing, toileting and transferring
F	Dependent in bathing, dressing, toileting, transferring and continence
G	Dependent in bathing, dressing, toileting, transferring, continence and feeding

(Katz *et al.* 1963)

The patients' risk of developing pressure wounds was assessed on arrival at the ward and then daily using the modified Norton scale (Ek *et al.* 1989) (Table 8). The patients were graded into one of three groups based on the score from the scale, 7-14 points low risk, 15-22 points medium risk, and 23-28 points high risk. Most of these patients fall into the high-risk category during their pre- and first post-operative day and for that reason preventive action was taken for all cases during that period. When the patients had regained their low-risk status, the measurements were discontinued.

Table 8 *The modified Norton scale*

Score	1	2	3	4
Mental condition	Fully oriented	Occasionally confused	Cannot answer adequately	No contact
Activity	Ambulant	Walks with help	Chair bound	Bedridden
Mobility	Full	Slightly limited	Very limited	Immobile
Food intake	Normal	Insufficient	Parental	No intake
Fluid intake	Normal	Insufficient	Parental	No intake
Continenence	Not	Occasional	Usually urine	Doubly
General physical condition	Good	Fair	Poor	Very bad

(Ek *et al.* 1989)

Data on pain and pain relief were extracted by checking the patients' clinical records. Entries made by nurses or physiotherapists of patients complaining of pain, during ambulation, or not being able to put enough weight on the operated leg were extracted. If these entries appeared repeatedly and on more than one day, they were interpreted as meaning that the pain relief was not adequate. The first three days post-operatively were excluded, since the acute-phase pain is sometimes very difficult to alleviate.

The intervention

Theoretical background

The intervention was based on the belief that, using a thorough arrival interview, it would be possible to identify the patients' rehabilitation potential and prevent or mitigate problems and also discern the individual person behind the broken hip. Perceptions are subjective and clinicians should recognise and value their importance to patients. They reflect the way the patients understand the situation and what they base their options on. How an individual perceives the situation also determines how the transition process will continue. The transition process and the options are perceived differently depending on how an individual perceives and copes with the present condition and there is no easy way safely to determine this, but the arrival interview questions can uncover essential information on how to guide the initial part of the transition that could prevent a failure to recover.

The interview

The transition is a passage from one relatively stable condition to another. The stable condition from which patients admitted with an acute hip fracture came was regarded as the last few weeks before the accident. In order to help the patients through the transition, it was necessary to survey what their stable condition was like. This could then work as a baseline and also as a guide for the care planning. By establishing a baseline and developing a care plan with both

intermediate and long-term goals, it was possible to follow the process indicators to make sure the transition was moving in the right direction (Schumacher *et al.* 1999). The interview questions concerned their health history, ongoing transitions such as health problems or losses and previous and current illnesses. Questions were asked about bodily function, nutrition such as appetite and weight loss, elimination difficulties, communication such as vision and hearing, heart and lung function and bodily pains. They were also asked if they were responsible for administering their medication.

All the questions included follow-up questions as to how the patients perceived their situation and if they perceived their problems, if any. Further questions related to the standard of their living such as whether they were living alone and if there were stairs, thresholds or narrow doorways. Questions were asked about the patients' need for assistance, such as home help, or, if their children provided help, what kind of help, how often and whether or not their children were living close by and if they were connected to the mobility service and/or had an emergency medical alarm. Questions were also asked about their physical function, basic ADL, instrumental ADL, gait capacity, need for walking aids, whether or not they could walk outdoors alone or with company, indoors alone or with company and ability to climb stairs. The transition property was also surveyed and the patients' awareness and recognition of transition experiences, their engagement and their will and potential to take responsibility for their rehabilitation were explored. The nurses were instructed to note spontaneous statements revealing the patients' perception of their own role in the rehabilitation. At the end of the interview, the rehabilitation was discussed and information was given based on the patient's perceptions. A preliminary rehabilitation prognosis was made within 48 hours and it was subsequently presented to the patients when they were emotionally and mentally ready. The nurses also presented the care and discharge plan to the patients' significant others who, together with the patient, discussed final and intermediate goals in order to establish a final care plan. The co-operation in relation to the care plan and goals was not only a matter of co-operation. It also acted as a way to enhance the patients' sense of empowerment and integrity.

The transitional process

The process indicators, such as symptoms linked to the diagnosis, were monitored to follow how the transition was proceeding. Constipation and signs such as infections and pressure wounds were also monitored constantly and patients who were found to have an increased risk were given preventive measures already from arrival. Symptoms of anxiety based on their predicament were given extra attention and, if needed, they were offered therapeutic help by the hospital welfare officer. Functional status was followed every day using the ADL index and, as long as they progressed according to their care plan, the transitional process was perceived as healthy. Signs of failure to connect were

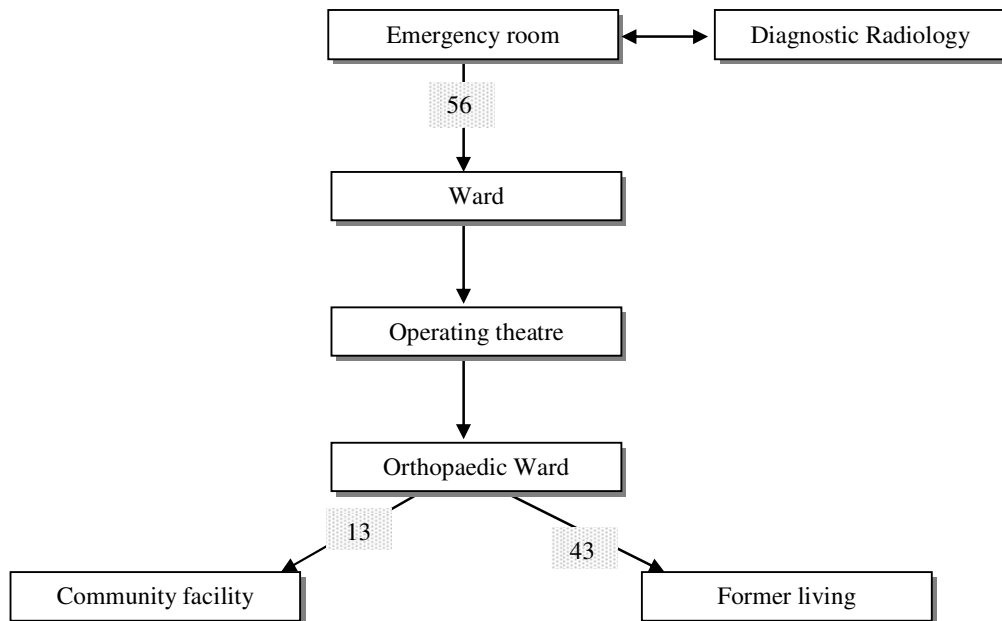
monitored and the relatives of risk patients were given privileged visiting hours. The sense of empowerment was created by being sensitive to personal wishes and by co-operating with the patients. In this way, the therapeutic alliance between patients and caregivers was improved. The sense of integrity was meant to be promoted by the accelerated training schedule, which aimed at rapid progress away from a feeling of dependence. During the hospital stay, the patients' confidence and the alliance between patients and caregivers were strengthened by commending the patients' advances and focusing their attention on their progress in the rehabilitation.

Developing the ICP

The ICP was developed with the intention of creating a care path with rapid pre-operative attention, increased continuity and an accelerated training programme based on the individual patients' prerequisites (Figure 5). It was developed by a multidisciplinary team who represented all the vocational groups and all the departments and essentially followed the method described in the literature (Rumble *et al.* 1996, Cheater 1996, Walsh 1997, Zander 1998, Dowsey *et al.* 1999). The ICP covered the hospital care from admission to the emergency room to discharge from the hospital and all the care given by the nurses, physicians, physiotherapists, occupational therapists and hospital welfare officer was included. The ICP was described in full detail in a guide booklet "Quality standard guide for patients with a hip fracture", which was available to all staff in case questions arose about how to act in certain situations. Before the start of the intervention, the staff at the emergency room and radiology department were encouraged to care for and treat these patients rapidly so they could be admitted to the ward and be ready for surgery as soon as possible. Even if the evidence was inconclusive, it appeared reasonable to keep the waiting time short, since patient suffering could be relieved and precious time would be saved. Medical treatment protocols were developed to enhance physicians' treatment of patients on anticoagulant drugs, anti-hypertensive medication, post-operative blood replacement and analgesics. Treatment protocols were developed, allowing nurses to control routine treatments such as blood tests, post-operative monitoring of vital signs, handling of surgical dressings and indwelling urinary catheters. Some of the measures could not be scheduled into the ICP care map but were pointed out during the introduction of the ICP to all staff. They were also described in the guide booklet "Quality standard guide for patients with a hip fracture". These measures included "temporary" pain medication, how to regulate the pre-operative starvation to keep it to a minimum and serve nutritional drinks and how to provide emotional support. Moreover, the question of inhibiting and promoting factors that emerged during the interview, if any, was addressed in order to promote a timely discharge where the patient felt safe and content.

Figure 5.

Clinical trajectory of care in the intervention group.



The documentation

The ICP documentation chart was developed in the form of a multidisciplinary “care map”, as described in the literature and comprised seven steps for the entire hospital period (Petryshen and Petryshen 1992, Hampton 1993). In order to make the ICP more flexible, it was made possible to spend more than one day on each step. The first ambulation was scheduled at a very early stage, either the same day or the morning after surgery. Early ambulation was meant to serve as a way for the patients to realise that they would be able to walk again. The amount of training was then increased from day to day in accordance with the patient’s prerequisites and the normal daily activities were incorporated into the programme. The patients were encouraged to get out of bed many times every day to go to the toilet and to eat their meals in the dining-room. Even if they could not walk all the way, they were encouraged to walk the distance of which they were capable and they could then be transported the rest of the way. In these situations, it was important to commend the patients’ efforts and point out their progress, which could turn a feeling of failure into a positive situation and in this manner support the patients. The ICPs steps were outlined as follows:

- The *first step* (admission procedure) comprised the arrival interview, a cognitive test and further assessment of the patient using the five

instruments, preparation for surgery, prophylactic measures and the standard pre-operative information.

- The *second step* comprised the first ambulation on the day of surgery and/or the next morning. The physiotherapist presented and explained the exercise programme. Indwelling urinary catheters were to be avoided, but if used they were to be discontinued the first day.
- The *third step* comprised ambulation in the morning and sitting up for at least one meal. The physiotherapist presented a more comprehensive information brochure.
- The *fourth step* comprised performing upper personal hygiene out of bed, sitting out of bed for all meals and walking to the bathroom.
- The *fifth step* comprised walking to and eating in the dining room for all meals.
- The *sixth and seventh steps* comprised further ambulatory training and performing personal hygiene, dressing and walking.

Ethical considerations

In the present study, the concerns were whether or not the demand for just and fair care was met, because the patients in the comparison group were not cared for in the same way as the patients in the intervention group. The care of the patients in the comparison group was, however, unchanged compared with before the study. Further, we did not know if the patients in the intervention group would appreciate the care they received more than the patients in the comparison group appreciated theirs. The ethical demand of doing well, not harming and being fair thereby appeared to be met. All the patients were provided with both verbal and written explanations of the study and the purpose of the study and they were assured that participation was voluntary and that the data would be treated confidentially. Informed consent was obtained from all patients. The study was approved by the hospital administration and the Human Ethics Committee, Göteborg University, Sweden.

SUMMARY OF PAPERS

Study I

The main findings in this study concern the variation in the informants' conceptions, of who was responsible for their recovery and in their views on the need for information pertinent to their condition. However, analyses also revealed similarities in the informants' conceptions. These common traits appeared in various forms and degrees in all the interviews.

Different conceptions

The Autonomous

The Autonomous appeared to be confident and accustomed to managing for themselves and being in control of their lives. They were willing to listen to the staff, but made their own decisions. One patient described how she acted in conjunction with an earlier fracture:

This leg was in plaster for nearly a year and then I was supposed to have physical therapy at the hospital, but I found it just too much trouble, so after a while I didn't bother. I exercised the leg myself.

Even if the Autonomous appeared to be strong, they felt just as vulnerable as the other groups. One informant pointed out that more information given preoperatively could have made a great difference:

Of course, if someone had come and sat down for a little while and talked. Saying something like, after a while you will be able to walk and maybe manage on your own again. That would have been reassuring, it really would. Because, I really must say, at moments like that, you get a feeling of being small and insignificant.

The Modest

The Modest gave the impression of being vulnerable and dependent on others and they expressed themselves cautiously. They worried more about their future ability to walk and to maintain their former lifestyle than did the others. They feared being discharged, saw only problems and appeared unaware of the progress they had made. They were reluctant to talk about their hopes and wishes for the future and did not see their own responsibility as clearly as the Autonomous. They wanted to be restored to their previous functional status, but were willing to go along and accept what was offered:

I've asked to be sent to a community facility after discharge, to get some more rehabilitation. But the doctor said that it wasn't possible, this is the rehabilitation. I had been hoping I could stay a little longer, but then I figured, there is nothing to do about it, maybe I can

get some help at home, my children will come and then I have my older sister.

These informants appreciated and were grateful for the information offered to them, but for some reason they did not request more, even though they seemed to want to. Asked if she had been given all the information she needed, one woman said:

No, I can't say that I have, but I guess I haven't asked enough either.

The Heedless

The Heedless differed dramatically from the other two groups in terms of how they regarded their situation. They appeared to view their situation with some detachment, almost as if it did not really concern them. When asked who was responsible for their rehabilitation, one 84-year-old woman said:

I don't know, it must be the physiotherapist who is involved in the treatment I think, hope. I don't care. It is not for me to say, but they usually come to help me.

The Heedless were characterised predominantly by a reluctance to reflect on their situation, by a refusal to accept responsibility and by their need for information. They did not appear to have reached a stage where planning for the future was relevant.

Common traits

Awareness

Informants lacked adequate knowledge about their condition, what to do and how to act and needed more information. On the second day after surgery, one woman was unaware of which joint that had been operated on or what she could do with her leg:

I sat here thinking that I have bent my leg, so obviously it is possible to bend it.

Shocking event

Many older people live alone so in the event of an accident it may take some time before they can get help. One of the informants spent the whole night waiting:

It was ten o'clock in the evening, I was in my bedroom, and fell to the floor. I was in terrible pain. The balcony door was open, I wanted to shut it but I could not move and I could not get up into bed. I spent

the whole night on the floor and at seven in the morning I could finally call my sister.

Although several suspected they had sustained a fracture, all of the informants were very distressed by the diagnosis and felt as if they had received an ominous verdict. One informant described how he lost his sense of reality:

I just could not believe it -, was this really happening to me? My thoughts went back and forth. Was my leg broken or was it a bad dream? After a while, I came to my senses and realised that my leg really was broken.

One female informant repeated several times the thoughts she had both before and after the operation:

It's not at all sure that I shall ever be able to walk again, maybe I will have to spend the rest of my life in a wheelchair.

Zest for life

All patients, regardless of age, health status, or abilities, expressed a strong desire to recuperate. One informant said that she had been convinced that she would not be able to walk again but that it all changed when the physiotherapists got her up for the first time:

They came in with the walker and helped me up on my feet and then I told them I do not think I can walk, but they said, come on we know you can do it and I did. After that I thought, damn it, I can do it and so it is, it may work. One can not give up you see, one needs to keep at it to the final breath.

A 93-year-old woman, admitted for a third fracture that year, said she was not going to give up:

You have to give it all you've got – if you're stubborn enough.

Studies II and III

The two study groups did not differ in terms of any of the pre-fracture demographic variables (Table 9). The mean length of hospital stay was 12.2 days (SD 3.5) in the intervention group vs. 26.3 days (SD 17.0) in the comparison group ($p < 0.000$).

Table 9 *Baseline statistics*

Data	Comparison (n=56)	Intervention (n=56)	p-value	Data	Comparison (n=56)	Intervention (n=56)	p-value
Female/male	42/14	41/15	1.0	Type of living:			
Mean age (SD)	84 (7.0)	84 (6.9)	0.9	Flat	31	37	0.3
Living:				House	13	7	
With someone	19	14		Service flat	12	12	
Alone	37	42	0.4	Need of home help services:			
				None	34	28	0.4
				Once a week	7	9	
				Daily	15	19	
Place of accident:				Type of walking aid:			
At home	41	43	0.8	None	27	22	0.3
Outside home	15	13		Stick	11	8	
				Walking frame	18	26	
Number of co-morbidities:				Gait capacity:			
Mean	2	3	0.3	Walking outdoors alone	31	26	
Range	(0-8)	(0-8)		Walking outdoors with assistance	10	11	0.4
				Walking indoors alone	13	13	
				Walking indoors with assistance	2	6	
General medical health†:				Cognitive functioning at admission††			
A	10	5	0.1	Mean	8	7	0.4
B	33	29		Median (Range)	9 (3-10)	8 (3-10)	
C	13	22		Pre-fracture independence†††:			
Intra-capsular fracture	29	21		80 – 100 %	36	35	
<i>(Hemiarthroplasty)</i>	<i>(28)</i>	<i>(18)</i>	0.1	60 – 79 %	13	10	0.3
<i>(Osteosynthesis:</i>				< 60 %	7	11	
<i>Two parallel nails)</i>	<i>(1)</i>	<i>(3)</i>		Mean (SD)	84 (16.5)	82 (23.1)	
Extra-capsular fracture	27	35					

Three patients died in the comparison group. Their available data were used.

† Ceder scale, †† Pfeiffer's test, ††† Functional Recovery Scale

Data are from the patients in both groups regarding pre-fracture and admission status. There were no differences in pre-fracture demographics between the groups.

The time spent at the different pre-operative ICP stages was measured and compared. The intervention group spent less time waiting at the emergency room before surgery (4 h (SD 1.9) vs. 5 h (SD 1.7); $p=0.02$) and receiving care on the ward, waiting for surgery, as compared with the comparison group (22 h (SD 10.7) vs. 23 h (SD 14.8); $p=0.6$, ns). The intervention group spent significantly less time between surgeries to first ambulation (20 h (SD 8) vs. 28 h (SD 13.8); $p<0.000$), as well as from arrival to hospital to first ambulation (41 h, (SD 13.2) vs. 49 h, (SD 19.2); $p=0.01$).

Table 10 *Rehabilitation results*

Comparison group (n=56*)			Intervention group (n=56)			P
ADL level			ADL level			
Pre-fracture	Discharge	(%)	Pre-fracture	Discharge	(%)	0.003
A (n=38)	A = 2 patients	(5)	A (n=34)	A = 7 patients	(21)	
	B = 19 patients	(50)		B = 20 patients	(59)	
	C = 5 patients	(13)		C = 5 patients	(15)	
	D = 5 patients	(14)		D = 0		
	E = 1 patient	(2)		E = 2 patients	(5)	
	F = 6 patients	(16)		F = 0		
B (n=12) (2 died)	B = 1 patient		B (n=8)	B = 1 patient		
	C = 0			C = 2 patients		
	D = 1 patient			D = 1 patient		
	E = 0			E = 3 patients		
	F = 8 patients			F = 1 patient		
C (n=2)	C = 0		C (n=6)	C = 1 patient		
	D = 0			D = 2 patients		
	E = 1 patient			E = 2 patients		
	F = 1 patient			F = 1 patient		
D (n=2) (1 died)	E = 1 patient		D (n=2)	D = 1 patient		
F (n=2)	F = 2 patients		F (n=6)	F = 6 patients		

* Three patients died in the comparison group

The table shows to what extent the patients were restored back to their pre-fracture functioning

In the intervention group, 48 patients (86%) were admitted as low dependent (ADL level A-C). The transitional process was successful in 36 patients (75%), who were discharged as low dependent. The comprehensive result revealed that, of the 34 patients (61%) who were independent before the fracture (ADL level A), seven patients (21%) were restored to ADL level A at discharge. The transitional process did not fail in any of the patients in the intervention group ($p=0.003$) (Table 10).

In the comparison group, 52 patients (93%) were admitted as low dependent (ADL level A-C). The transitional process was successful for 27 patients (52%), who were discharged as low dependent. The comprehensive result revealed that, of the 38 patients (68%) who were independent before the fracture (ADL level A), two patients (5%) were restored to ADL level A at discharge. In 11 patients (16%), the transitional process failed, as they did not progress at all post-operatively and remained at ADL level F (dependent), despite a prolonged hospital stay (Table 10). In the comparison group, a significant correlation between age and length of hospital stay was found ($p=0.01$). No similar correlation was seen in the intervention group (Table 11).

Table 11 *Correlation age hospital stay*

Age groups	Comparison group (n=53)	Intervention group (n=56)
65 – 69 years	16 days	14 days
70 – 75 years	19 days	11 days
76 - 79 years	16 days	16 days
80 – 85 years	20 days	13 days
86 – 89 years	32 days	12 days
90 - 97 years	46 days	12 days
	0.489**	-0.021

Pearson's product-moment correlation between age and length of hospital stay

*** The correlation is significant at the 0.01 level*

The intervention group was less dependent on walking aids. In the intervention group, six patients were able to walk without a walking aid or with a stick compared with one in the comparison group ($p=0.02$). In the intervention group, 50 patients walked with a walker or a walking frame versus 52 in the comparison group. In terms of walking distance, there were no significant differences; 26 patients in the intervention group were able to walk up to 100 metres versus 30 patients in the comparison group. Thirty patients in the intervention group were able to walk up to 50 metres versus 23 patients in the comparison group.

There was a significant decrease in the number of days with an indwelling urinary catheter, from a mean of 2.8 (SD 2.4) in the intervention group, to a mean of 6.4 days (SD 5.3) in the comparison group ($p<0.001$). Half the patients in the intervention group did not have an indwelling urinary catheter or they only had one for the day of surgery. The number of urinary tract infections did not differ between the groups (Table 12).

Table 12 *Indwelling urinary catheters*

Days	Comparison group (n=53) *	Intervention group (n=56)	p-value
0	-	12	<0.001
1	-	15	
2	4	5	
3	6	12	
4	10	5	
5	9	3	
6	6	-	
≥ 7	18 ¹	4 ¹	
UTI	12	13	ns

¹Two patients in both groups had a permanent indwelling urinary catheter.

* Missing data. Three patients died in the comparison group.

The number of care days with an indwelling urinary catheter and the number of patients who developed a urinary traction infection.

In the clinical records of the intervention group, 12 patients stated that the pain management was inadequate and the same thing was found in the clinical records of 35 patients in the comparison group ($p < 0.000$). There was also a significant difference in the complication rate between the groups; there were five medical complications in the intervention group compared with 14 in the comparison group ($p = 0.003$) and eight pressure wounds in the intervention group compared with 19 in the comparison group ($p = 0.02$).

The discharge and transfer procedure could be started earlier in the intervention group, contact with the community social worker was made 10 days earlier in the intervention group ($p = 0.0001$) and the discharge planning meetings took place five days earlier in the intervention group ($p = 0.003$). The patients returned to their pre-fracture living to a larger extent, i.e. 43 patients (77%) in the intervention group versus 37 patients (66%) in the comparison group; this difference was not significant, however. There were no re-admissions within 30 days related to the fracture in either group and the one-year mortality was identical, i.e. 16% of the patients in both groups died during the first year.

Study IV

There was a significant difference between the groups in terms of both costs and effectiveness (effectiveness is further described in Studies II and III). The cost-effectiveness analysis revealed that treatment A, the ICP intervention, was less expensive than treatment B, standard care, and treatment A was also more effective than treatment B.

In the intervention group 64% of the patients were restored to their ADL level of A-C at an average cost per patient of € 9,685 € (SD € 2,229), and in the comparison group, 48% of the patients were restored to their ADL level of A-C at an average cost per patient of € 16,002 (SD € 8,027) (p=0.000) (Table 13). The hotel costs accounted for approximately 72% of the total cost and this cost was reduced by 40% (p=0.000); the hotel cost represented the greatest reduction (Table 13). The cost reductions were also significant in three other sub-categories, the cost of chemistry, which decreased by 30% (p=0.009), the cost of radiology, which decreased by 15% (p=0.05), and the cost of theatre/post-op, which decreased by 21% (p=0.005). In the sub-category for blood transfusions, the cost was higher in the intervention group although not significantly so. Expressed as money, the hospital savings totalled € 1,611 for chemistry, € 3,408 for radiology, € 295,158 for hotel costs, while the total saving was € 327,282.

Cost of developing the ICP

During the four months, the project leader spent 350 hours working on the ICP at an approximate cost of € 8,680. The team members, on average five persons, spent 170 hours each in meetings and including the physician it was an approximate cost of € 3,997. The two-hour training offered to the staff before implementing the ICP cost approximately € 1,858 (Table 2). The grand total for developing the ICP came to approximately € 14,535.

Cost-effectiveness analysis

The cost for treatment A was € 534,249 producing 36 successfully rehabilitated patients'. The cost for treatment B was € 861,532 producing 27 successfully rehabilitated patients'.

Using the equation; $\frac{\text{cost A } 534,249}{\text{effect A } 36 \text{ successful cases}}$ vs. $\frac{\text{cost B } 861,532}{\text{effect B } 27 \text{ successful cases}} =$

yielding a cost effectiveness ratio of € 14,840 per successfully rehabilitated patient in treatment A and a fail percentage of 25 % and € 31,908 per successfully rehabilitated patient in treatment B and a fail percentage of 46 %.

Table 13 Mean costs of treatment

Table 13 Mean costs of treatment

Comparison group N=53*			Intervention group N=55●				p-value
	Mean (€)	SD	Mean (€)	SD	95% CI		
					Lower	Upper	
HOTEL COST							
Costs	12 715	7 548	7 209	2 155	3 687	7 993	0.000
TREATMENT COST							
Radiology	453	244	374	167	-1.8	158.6	0.05
Clinical physiology	94.6	138.6	94.6	137.4	-199	204.8	0.9
Chemistry	100.2	79	69	45	8.2	57.7	0.009
Microbiology	20.3	17	21.5	26.6	-129	14.9	0.9
Blood transfusions	203.8	210	263.7	241.5	-149.2	23.2	0.1
Theatre/post-op	1 455	617	1 157	459	94.3	511.7	0.005
TOTAL COST	16 002	7 959	9 685	2 219	4 255	8828	0.000

*Three patients in the comparison group died

● Data missing from one patient

All costs are given at the year 2004 rates, and they were then converted from Swedish crowns (SEK) to euros (€) using the yearly average exchange rate for the year 2004 (9.1268 SEK/€)

GENERAL DISCUSSION

Patients who are treated for a hip fracture cannot be regarded as a homogeneous group who do or do not participate in their rehabilitation process. The differences found in the present study indicate that the rehabilitation results can be improved if the patients are thoroughly investigated upon arrival at the ward, especially in terms of their prerequisites and perceptions, in order to ensure a healthy start to the transition (Study III). The results presenting this study show a significantly improved recovery result (Study III) (Table 10). Not only did more patients in the intervention group reach their pre-fracture ADL level, but also no patients in the intervention group who were admitted as independent failed to thrive post-operatively, which was the most salient result. The rehabilitation result for patients treated for a hip fracture, at discharge from hospital, is still unclear and is usually not well described. The ICP intervention group was associated with a significantly shorter hospital stay, i.e. the number of care days was reduced by more than half compared with the comparison group (Study II). Moreover, the intervention group was less dependent on walking aids, equal in gait capacity and these patients returned to their pre-fracture living to a larger extent, i.e. 43 patients (77%) in the intervention group versus 37 patients (66%) in the comparison group, even if the difference was not significant, ($p=0.5$). The early ambulation and the design of the training protocol reduced the number of pressure wounds, which were also reduced by half. Focusing attention on each patient, and following the transition process indicators, was believed to play an important role in reducing the number of medical complications (Study III). Moreover, the intervention group had a significantly lower average cost per patient of € 9,685 compared with € 16,002 per patient in the comparison group ($p=0.000$) (Study IV) (Table 13).

The transition theory was used as a framework in the ICP-based intervention, which changed the way the care was performed and also introduced a different way of thinking compared with standard care. In standard care, the assessment was not related to any kind of objective measurement. Instead, age and appearance on admission and immediately after surgery, based on clinical experience, were predominantly used to guide the care. This way of performing the care was found to be overprotective and, as a result, left the initiative to the patients who, in that situation, were in fact not able to take the responsibility (Table 10). As a result, they were kept in hospital for a prolonged time of training which further resulted in a poor outcome (Study III). The training for those patients, during the first few days, consisted essentially of sitting at the bedside and standing or walking a few steps once a day with the physiotherapists. In some cases, the patients were found to be too frail to be mobilised at all for several days. It has been shown that octogenarians lose about 1-3% of their muscle strength every day when immobilised in bed and, at the

same time, they have to use 70-80% of their power just to get up (Larsson and Rundgren 1997). A negative spiral therefore developed for these patients who appeared frail and the training was continued in a prudent manner. The negative spiral was further fuelled by the use of indwelling urinary catheters, which the patients kept until they were considered strong enough to walk to the toilet (Table 12) (Study III). With no evidence to the contrary and no goals being set, these patients were regarded as powerless and no one tried to push on the training, fearing that the patients were too frail and unable to cope with the training.

Opinions on when the first rehabilitation should start and the kind of training of which it should consist appear to vary between hospitals and countries. The concerns are mainly associated with the medical perspective, whether or not the surgical measure and the patients' bone structure can tolerate weight being put on the operated leg. Recommendations differ for this reason and the Swedish national guidelines for the treatment and care of patients with hip fractures recommend prudent early training, such as bed exercises (Socialstyrelsen 2003). In his description of an ICP, Koval (2004) recommends that sitting out of bed on the first day is sufficient. In their review of published studies, Parker *et al.* (2002) conclude that there is insufficient evidence in terms of the effects of early weight-bearing after cervical fracture surgery. In the present study, it was found that prudent training significantly increased the length of hospital stay and was also associated with a very poor outcome; these results are supported by another recent study (Hagsten *et al.* 2006).

Little research interest has been focused on patients' worries and concerns with regard to the rehabilitation after hip fracture treatment and only one study was found in which patients described their pre-operative perceptions (Bowman 1997). It has, however, been reported that being transferred and admitted to hospital releases a need for trust and security and both the elderly patients and their relatives have a need to be seen and listened to (Nyström 2003, Sahlsten *et al.* 2005, Kihlgren 2005). The fears and worries expressed by the patients in the present study suggest that they need more attention and emotional support to ensure a healthy start to the transition. The detailed arrival interview appeared not only to fulfil this need for comfort and information, it was also perceived very positively by both the patients and their relatives. The interview also provided a chance for the patients, and their relatives if present, to convey important personal information. The findings from the phenomenographic study (Study I), especially when it came to the early first ambulation, were found to be critical; a defining moment, which triggered the patients' intrinsic power and will to overcome their predicament. The idea behind the intervention was to use this knowledge to prevent a negative spiral from developing and to create a positive chain reaction. The arrival interview yielded very detailed information about not only the physical but also the psychological and psychosocial areas.

By performing this detailed arrival interview, it was possible to determine the individual patient's prerequisites for rehabilitation (Studies II, III). All the patients were found to be able to cope with an early first ambulation on the day of surgery or the next morning, which included standing up and walking at least a few steps. Thereafter, daily progress was achieved at an even pace; this was accomplished by being sensitive to the patients and their resources, as well as being aware of their physical limitations, i.e. ensuring a balance between training and rest.

The element of natural needs and the patients' motivation constituted the major part of the training, which also made the rehabilitation patient centred to a high degree. Getting out of bed many times a day, for meals and toilet visits was therefore used in the training and this training was possible to individualise by increasing it stepwise. Assisting the patients to sit first by the bed, then by the table in the room and finally in the dining room, depending on their progress, was effective. Refraining from the use of indwelling urinary catheters was another effective measure, where the patients' need for toilet visits can be described as a typical patient-motivated need. During the first few days, the patients sometimes felt a little hesitant about using their fractured leg and were therefore reluctant to participate. Listening to them and discussing their concerns not only diminished their reluctance but also enhanced their sense of integrity and autonomy and also created an opportunity for patient education. The training therefore became more natural to them and they also started to take their own initiatives. All these actions increased the collaboration between the patients and the nurses, which strengthened the partnership, facilitating patient education, and also made it easier for the patients to approach the nurses with queries.

With the increasing number of hip fractures, the economic aspect is becoming increasingly important; something recent studies have also recognised (Autier *et al.* 2000, Haentjens *et al.* 2001, Braithwaite *et al.* 2003, Lawrence *et al.* 2005). In a recent English study, Lawrence *et al.* (2005) reported a mean hospital stay of 23 days, at an average cost per patient of € 12,163 and the ward costs accounted for 84% of the total costs. Haentjens *et al.* (2001) found a great difference in cost in their review of 31 studies, which were published between 1980 and 2000, the average cost of the hospital stay was USD 7,000, with the lowest cost USD 739 (Søreide *et al.* 1980) and the highest USD 44,000 (Schürch *et al.* 1996). One of the most important findings in the present study was that, even if the ICP intervention treatment was more effective than standard care, it was also less expensive. The reduction originated, for the most part, from the reduction in the length of hospital stay, but the decrease was also significant in several of the sub-cost categories. It was also found that, with an increased hospital stay, other costs, such as the cost of radiology and chemistry, increased significantly, but the reasons for this were unclear. The result also shows that,

even if the daily cost was higher in the orthopaedic department than in the geriatric department (€ 592 vs. € 438), it still was an advantage to maintain the continuity and let the patients remain in the orthopaedic department. The hotel cost in the intervention group accounted for 72% of the total cost versus 80% in the comparison group, the surgical costs added 12% in the intervention group versus 9% in the comparison group, and the remainder of the cost was due to investigations such as radiology, microbiology, chemistry and blood transfusions.

The cost of developing the ICP was also a measure that could influence the overall result. The development of the ICP was effective and all the vocational groups contributed in a commendable way. The fact that the whole team was not able to be present at all the meetings did not affect the result negatively. As a result, the topics that were discussed at the meetings were dependent on the vocational groups that were present. The project leader put together the ICP piece by piece and stayed in close contact with the other team members by phone and e-mail. No really difficult subject emerged and the team was stimulated by the opportunity to participate in developing the care pathway. This way of working on the ICP probably kept the costs at a low level, but these costs could not be compared with others, because no other study was found in which the cost of developing the ICP has been described. Owing to the way the ICP was developed, it was not possible to calculate all the costs related to the work. The costs for time, such as team members reading and discussing literature, quick meetings with the physician on the ward, could not be calculated. Office supplies and the cost of the conference room and similar expenditure were not calculated either. Despite this, it was felt that the major part of the cost of preparing the ICP was covered.

The transition

Transition occurs when a person's current reality is disrupted, causing a forced or chosen change that results in the need to construct a new reality. By understanding the transitional process, the nurses were better equipped to assist the patients through the process of adaptation (Meleis and Trangenstein 1994, Kralik *et al.* 2006). The intervention was designed to define the adaptation process by determining a starting point and establishing a care plan for rehabilitation. The transition was monitored by the nurses using process indicators in order to confirm that the transition was moving in the right direction (Study III) (Schumacher *et al.* 1999). An understanding was obtained from the arrival interview and it then provided a platform that could be regarded as the starting point for the prognostic reasoning (Carnevali 1993). Some transitions are associated with identifiable marker events, critical points and events. They could be associated with an increasing awareness of change or difference, or more active involvement in dealing with the rehabilitation experience (Meleis *et al.* 2000). There were some identifiable marker events that

were salient in the present study. Two negative critical points were noted; the fall itself, because some informants were alone and helpless for hours, and the diagnosis, which the informants experienced as distressing and ominous. One positive critical point was identified, i.e. when the informants were first able to put weight on the fractured leg and thus realised that they might be able to walk again. This positive critical point appeared to be a defining moment and, despite involving both discomfort and pain, it also triggered a strong zest for life (Study I).

By following the transitional process indicators, it was possible to avoid serious deviations from the care plan. The patients' functional status, which should proceed at a reasonably even pace in a healthy transition, was found to be an important process indicator (Latham *et al.* 2006). In the study of recovery patterns in patients treated for a hip fracture, Latham *et al.* (2006) found that the rate of change in ADL improvement was greater during the first six days than during the following six days. In order to guide and support this process, the patients' pre-fracture ability needs to be known and their progress in ADL needs to be assessed daily.

Pain as a process indicator was found to be very important to follow in order to assist the patients in pursuing an accelerated training schedule (Hallström *et al.* 2000, Morrison *et al.* 2003, Ardery *et al.* 2003). Hip fracture surgery is related to considerable post-operative pain, where the acute-phase pain is followed by pain related to movement and putting weight on the operated leg. Earlier studies have reported misconceptions about elderly people's ability to tolerate the medication, as well as doubts about whether or not they suffer from pain (Walker *et al.* 1990, Hofland 1992, Closs 1996, Hallström *et al.* 2000, Ardery *et al.* 2003). Recent studies report that elderly patients express their pain in a nuanced and detailed way in everyday language and they do not simply limit the pain experience to intensity (Bergh *et al.* 2005 a, Bergh *et al.* 2005 b). The management of pain relief is very much the domain of nurses and, in the present study; it was based on the enhanced patient-nurse interaction (Hallström *et al.* 2000). Although the standing pain medication is important, it will always need to be complemented with additional pain medication to relieve patients from temporary intense pain.

Subjective expressions of illness, such as symptoms, must be assessed as structured as signs by health providers; this is simplified if it is acknowledged by the organization of care (Ekman *et al.* 2005a). Less salient, but never the less important, process indicators, such as sense of disconnectedness, empowerment and integrity, were also met (Schumacher *et al.* 1999). The sense of disconnectedness was met by facilitating continuous contact with the patients' relatives and their homes, offering them bedside telephones and assisting patients with impaired vision to make their calls. Generous visiting hours were also offered on a regular basis, something that was very much appreciated by

patients and relatives. The sense of empowerment and integrity was met by listening and being sensitive to the way the patients wanted to work on their rehabilitation and by frequently commending them on their progress.

The ICP

The most difficult part of the ICP care trajectory was to affect the care from admission to first ambulation, because so many different professionals were involved. The national guideline recommends a very high priority, waiting for surgery, for these patients, which is in line with the results in the present study (Socialstyrelsen 2003) (Study II, III, IV). On average, patients admitted with an acute hip fracture usually have to wait for an operation, approximately 24 hours in Sweden today (Thorngren 2004). It is, however, unclear whether or not waiting for surgery has an adverse effect on rehabilitation outcome and length of hospital stay. Whether or not this affects the result, patient suffering and costs definitely do which are reasons enough to continue our efforts to reduce the waiting time (Finlayson 2005). In the intervention, the patients' path from admission to the emergency room, to the ward, to surgery and finally back to the ward and the first ambulation took a total of almost two days on average. Even if this result was significantly improved, compared with standard care, it can most probably be developed still further. Despite difficulties pre-operatively, the ICP was found to be a practical tool for guiding the patients' care throughout the hospital stay (Study II).

The patient record of an ICP is described in the literature as a multidisciplinary "care map" on which the actions are described on a day-to-day basis (Hampton 1993). In the present study, it was somewhat modified, mapping the care in steps, where it was possible to spend up to three days on each step allowing the patients to have a "difficult" day, and still follow the ICP. The ICP was self-explanatory and the care map worked as a guide, which may explain why it was possible to achieve these results without having a run-in period or increasing the number of staff (Study II) (Hampton 1993). The ICP method and the concept of transition worked well together, intertwined in the intervention, a combination that was previously used in an earlier study of patients treated for a hip fracture (Simpson 2002). With the ICP method, an instrument which facilitated a new way of thinking was introduced; the results were more in focus than the tasks and the concept of transition helped the nurses, and other health workers, to focus on patients' individual perceptions, experiences and what the patients had gone through (Study III).

Patient participation in the planning of care and interactions with the health-care professionals is being increasingly emphasised and discussed (Hälsa- och sjukvårdslagen 1982, Statens Offentliga Utredningar (SOU) 1997). The patient's role has traditionally been passive and submissive and one in which the professional decides and acts with authority and power in the patient's best interest (SOU 1997). Discharge planning, which is an important part of the care

planning, has been found to be complex, when it involves older people with comorbidities and chronic conditions (Jewell 1996, Zander 2002). Most patients treated for a hip fracture are in need of help, at least initially, after being discharged from hospital. In order to create a smooth transition from the hospital to their previous way of living, co-operation with the community aid workers had to begin at an early stage and this was highlighted in the ICPs care map. The first notification, which only included information that the patient had been admitted to hospital, was sent after the arrival interview, with the patient's permission. The second notification, which included the extent to which the patient had recovered, was sent five days before the estimated discharge and, prior to that, the patient was given a written brochure describing the discharge procedure. During these five days, the patients had time to prepare themselves and to discuss their options with their relatives and with the nurses (Studies II, III).

Methodological considerations

Comparing the cost and effectiveness for a group such as patients treated for a hip fracture involves problems at both individual level, since not all patients can be restored, and organisational level, because there are so many different health care systems. At organisational level, these patients are often transferred to other rehabilitation units inside or outside the hospital and today in some countries home rehabilitation has been developed, thereby further reducing the hospital stay. In order to compare the effectiveness of health care, studies need to take account of the patients' status at both admission and discharge in order to show the extent to which the rehabilitation was successful during the hospital period. In most studies comparing ICPs with other care, the extent to which patients have been restored is not reported (Choong *et al.* 2000, Tarling *et al.* 2002, Kwan *et al.* 2004, Roberts *et al.* 2004, Gholve *et al.* 2005). The rehabilitation result is an independent measure designed to make sure that the cost has not simply shifted from the hospital to the community (Cheah 2000). In the present study, baseline statistics showing the patients' physical abilities were produced and it was then possible to determine the extent to which they had recovered at discharge. Patients admitted as independent and discharged as independent or low dependent (ADL level A-C) were regarded as successful. Patients admitted as independent and discharged as high dependent (ADL-level D-G) were regarded as unsuccessful. Patients admitted as high dependent were naturally discharged as high dependent and could be regarded as successful, but they were not calculated as such.

No patients, young or old, have recovered completely when they are discharged from hospital after a serious injury and they will always need additional time to recuperate. Patients, who were independent before the fracture, even if they were old, have been found to be able to regain their independence after being discharged from hospital (Curry-Cox *et al.* 2003). Robinson (1999) describes the

ingenuity of patients treated for a hip fracture, the way they developed their own methods to increase their ability to become independent. Elderly patients who are at least restored to a low-dependent level during hospital rehabilitation can further develop their abilities in their homes in order to gain independence. Hence, as long as the patients in the intervention group had regained equal or better physical capacity at discharge, this could not simply be regarded as a shifting of the costs to the community. Moreover, to further verify the consequences of the two different care systems, the 30-day re-admission and one-year survival rate were also checked and found to be similar in both groups (Studies II, III).

The randomised, controlled trial design is considered to be the gold standard for evaluating interventions; however, its use in studies of this kind is somewhat problematic because they involve interactions between patients and nurses. If two different wards are used, it is difficult to know whether it was the change of actions or the interactions between the health workers and the patients that made the difference. In most studies, a before-and-after design is preferred. The present study was carried out using a quasi-experimental, prospective design, where an intervention group was compared with a standard care comparison group (Polit and Hungler, 1995). One disadvantage of this design is that it precludes conclusions about the true effects of an intervention, i.e. knowing whether between-group differences are due to the intervention or to other factors. However, most studies of integrated care pathways in patients with hip fractures have been conducted using this method (Choong *et al.* 2000, Tarling *et al.* 2002, Roberts *et al.* 2004, Gholve *et al.* 2005). The circumstances at the hospital were the same throughout the study period; no major changes took place at any of the clinics, which care for these patients. At the orthopaedic department, the number of staff was similar for all professional groups throughout the study period.

CLINICAL PERSPECTIVE

The salient impression from many years of caring for patients with a hip fracture was their modest disposition and their unwillingness to take responsibility for their rehabilitation. However, when these patients were interviewed and given the attention and time to explain, a new side of them emerged. They expressed an intrinsic and surprisingly strong will to make the effort and subject themselves to the strain and pain, which is involved in the rehabilitation process after a hip fracture. None of them knew very much about hip fractures – all the difficulties related to the treatment, the rehabilitation or the consequences, which often resulted in a very rough start to the rehabilitation process. The patients varied a great deal in their involvement in the rehabilitation process, as well as in their conceptions of who was responsible for their recovery and in their views of the need for any detailed information pertinent to their condition. Three categories of description were formulated: the *Autonomous category*, i.e. patients who were self-sufficient and used to taking care of themselves and who searched for relevant information; the *Modest category*, i.e. frail patients in need of more support and who wanted information but did not ask for it; and the *Heedless category*, i.e. patients who were already dependent, who were not aware of their own responsibility and were not interested in information. In a study of elderly patients' perceptions of their participation in care planning, similar results were found, regardless of whether the patients came from acute wards or geriatric wards (Larsson-Lund *et al.* 2001).

Being old and exposed to such a severe injury as a hip fracture, the patients did not generally know what to think and being presented with the diagnosis put them in a shock-like state. All of them said that they thought that they would never be able to walk ever again and, even worse, that they would become dependent on others for the rest of their life. Despite their strong zest for life, they needed to realise that they had the potential to recover and regain their independence. Although they were told that the hip fracture would heal and they would be able to put weight on the leg again, they could not believe it. The defining moment, when they finally started to believe it, was after the first ambulation, when they sensed that walking again really was possible and that they would be able to recover their ability. This triggered their zest for life, releasing their intrinsic power.

The intervention emanated from the ICP method, which is a standardised process covering critical elements of care and rehabilitation. The development of the ICP was also guided by the transition theory, which was a successful combination, because the ICP focuses on structures based on general evidence, while the theory focuses on the individual patient. Building on the three categories of patient characteristics found in the phenomenographic study, the

intervention aimed to discern the person behind the fracture, trying to understand and identify each individual's resources for and barriers to successful rehabilitation and thereby considering each patient's history and context. The theoretical guidance divides the transition into different parts, making it obvious that a healthy transition must start with exploring each patient. The condition for the intervention was the patients' motivation for rehabilitation and their prerequisites to cope with it. A detailed interview was conducted on arrival at the ward, since it was important to create an opportunity for the patients to convey their perceptions. The discharge process started at admission and the arrival interview exposed both inhibiting and promoting factors. Examples of inhibiting factors were minor obstacles in their previous life or the patients' own understanding of their potential. Moreover, the interview was meant to provide an opportunity for the patients and their relatives, if present, to convey important personal information, establishing the feeling that they were seen and listened to. The arrival interview was designed to collect information not only about the physical and psychosocial areas but more importantly also about the patient's own perception of his/her present condition and the rehabilitation.

The intervention also aimed to regulate the quality of care and reduce the length of hospital stay. Controlling and standardise key parts of the care was another feature of the ICP, still focusing on progress and results, while respecting and considering the individual person. In the phenomenographic study, these patients were found to be resilient and to possess a strong intrinsic power, but they were also in need of information and support to use it. The concept of transition, intertwined within the ICP, guided the patient-motivated care actions, assisting the patients to develop new knowledge and skills, i.e. with the help of the staff, learning how to use personal aids or inventing their own solutions that could enhance their independence. The transitional process indicators, in connection with the rehabilitation of patients treated for a hip fracture, were identified and addressed accordingly. Functional status was followed continuously for the early detection of any unexpected interruptions. The patients' symptom experience was the main point of focus, as it reflects the patient's perception of his/her condition. The sense of connectedness was met by facilitating continuous contact with the patients' relatives and their homes, while the sense of empowerment and integrity was met by listening and being sensitive to how they wanted to work with their rehabilitation. Assisting them to accomplish goals on the way to independence, such as being able to take care of their personal hygiene and going to the bathroom, was also an important means of generating integrity and self-respect.

The intervention in the present study not only reduced the length of hospital stay for patients with a hip fracture to less than half. More importantly, the intervention respected each patient's personal identity throughout the whole rehabilitation process while still using evidence-based knowledge.

CLINICAL IMPLICATIONS

It was shown that, even if the care was based on a standardised course of events, it was possible to tailor the process to each individual patient's needs. The well-proven surgical treatment that now allows patients to put weight on the operated leg was a good basis for the rehabilitation. However, the care requires further improvement in several areas, such as assessment of the patients, discerning the personality of the patient who is being treated for a disease and, more importantly, ways of using this knowledge to develop the optimal care. The patient's role has traditionally been passive and submissive, leaving the professionals to decide and act with authority and power in what is considered to be the patient's best interest. This kind of professional-patient relationship is based on a medical decision-making model and is still common in the care of the elderly, who are often considered to be unable to decide for themselves. Using a thorough investigation of the patients, their prerequisites and perceptions and allowing them to convey important personal information, it was possible to support and assist them in setting goals and achieving them. However, it was found to be extremely important to keep the period of inactivity, such as the time to the first ambulation, as short as possible, in order not to lose basic physical skills. Elderly patients with a hip fracture have a strong zest for life and individual resources, which can be powerful healing tools, and this is probably also the case in a number of other conditions where the personal identity is "hidden" behind the disease and is not acknowledged and supported by the health providers. Moreover, the results of the present study could most probably be generalised to apply to all patients with a hip fracture, as well as other groups of patients, especially elderly ones.

CONCLUSIONS

- Elderly patients with a hip fracture had a strong zest for life and in-built power that can and should be used much more than it is today. They were not well informed about the hip fracture as a condition, especially the difficulties related to the treatment, and the rehabilitation.
- These patients varied greatly in terms of their involvement in the rehabilitation process, as well as in their conceptions of who was responsible for their recovery, and in their views of the need for any detailed information pertinent to their condition. These patients was categorised into the following three categories.
 - Autonomous
Patients who were self-sufficient and were used to taking care of themselves and who searched for relevant information.
 - Modest
Frail patients who were in need of more support and who want information but do not ask for it.
 - Heedless
Patients who were already dependent, who were not aware of their own responsibility and were not interested in information.
- The ICP was a multidisciplinary project which was found to be very effective, in terms of patient well-being, reduced hospital stay and reduced cost.
- By using an in-depth interview with the patients when they arrive at the ward, all essential information was retrieved about their prerequisites for rehabilitation, as well as the nature and condition of the transition. The interview also provided the patients with an opportunity to convey important personal perceptions and information. Moreover, it enabled nurses to plan an effective hospital discharge at an early stage in concert with the patients and their relatives.
- By using different measurement instruments, it was possible to predict the patients' prerequisites, which resulted in an increased number of patients who were rehabilitated and restored to their pre-fracture ADL level in a shorter time frame.
- It was important to subject these patients to an accelerated training programme in order to avoid failure in recovery. Early ambulation was important in order to reassure the patients at an early stage in their rehabilitation that they will have a chance to reach their pre-fracture level

of physical function. Administering effective pain relief was important in order to assist the patients in the accelerated training programme.

- It was an advantage to maintain the continuity during the post-operative rehabilitation period.
- The ICP treatment was less expensive and more effective than standard care. The reduction in cost was based on the reduction in the length of hospital stay, although the cost reduction was also due to reduced costs for chemistry, radiology and surgery/post-operative care. The cost of radiology and chemistry increased significantly with a prolonged hospital stay.

Patienter med akuta höftfrakturer – motivation, effektivitet och kostnader - en jämförelse mellan två olika sätt att vårda patienterna

Lars-Eric Olsson

Abstrakt

Vården av patienter med höftfraktur varierar mellan sjukhus i Sverige vilket leder till stor spännvidd i antalet vård dagar. Detta beror på att patienter ofta flyttas från ortopedisk klinik till geriatrisk klinik och därefter kommunal vårdinrättning samt i bästa fall slutligen hem. Nuvarande vårdsystem omöjliggör jämförelse av rehabiliteringsresultaten och torde även kunna förbättras avseende kvalitet och effektivitet

Det övergripande syftet med studien var att undersöka sjukhusvården för patienter med akuta höftfrakturer – att beskriva patienters uppfattningar avseende sin situation, samt att jämföra effektivitet och kostnader mellan två olika vårdsystem. Patienterna intervjuades angående sin situation efter operationen, och en före-och-efter mätning användes för att jämföra utfallet av vården mellan två olika patientgrupper och kostnadseffektiviteten i de båda vårdsystemen utvärderades.

Patienternas uppfattningar om rehabiliteringsprocessen varierade avsevärt. Tre beskrivningskategorier formulerades: de *Autonoma* var självständiga patienter vana att ta hand om sig själva; de *Modesta* var patienter i stort behov av ökat stöd; och de *Bekymmerslösa* var redan beroende av andra. Gemensamt var att alla behövde mer information, alla var bekymrade över sin framtida fysiska förmåga, men att alla hade en mycket stark livslust. Interventionen utformades som ett individualiserat vårdprogram där varje patients egen bedömning av hinder och resurser för rehabilitering låg till grund för en accelererad träning. Den genomsnittliga vårdtiden på sjukhuset för jämförelsegruppen var 26,3 dagar, men minskade till 12,2 dagar i interventionsgruppen ($p < 0,000$). I interventionsgruppen var 21% av patienterna, inskrivna som oberoende, återställda till ADL nivå A (oberoende) och ingen hade förblivit helt beroende, (ADL nivå F) vid utskrivningen. I jämförelsegruppen var 5% av patienterna återställda till ADL nivå A och 16% var kvar på ADL nivå F vid utskrivningen ($p = 0,003$). Kostnadsresultatet visade en 40% minskning av den genomsnittliga totala kostnaden i interventionsgruppen ($p = 0,000$). De dagliga kostnaderna stod för den största reduktionen (43%, $p = 0,000$), men signifikanta reduktioner sågs även i kostnader för analys av blodprov (minskning 30%), röntgen (minskning 17%), och operations/uppvakning kostnad (minskning 21%) ($p = 0,005$). Den totala kostnaden för att utarbeta det kliniska vårdprogrammet beräknades till 132 202 SEK.

Studien visade att patienternas olika uppfattningar om sitt tillstånd måste vara en viktig utgångspunkt i rehabiliteringsprocessen. Den s.k. ”transition” teorin integrerades i vårdprogrammet och vägledde vårdhandlingarna. Detta innebar att patienterna stimulerades att utveckla ny kunskap och förmåga som att använda personliga hjälpmedel eller finna egna lösningar för att förbättra sitt oberoende. Sjuksköterskorna övervakade rehabiliteringen genom att följa i förväg identifierade variabler eller indikationer av vikt och kunde därigenom förvissa sig om att rehabiliteringen fortskred som planerat. Interventionen var kostnadseffektiv och den största reduktionen kom från den dagliga vårdkostnaden. Ett samband sågs mellan lång vårdtid och ökade undersökningskostnader och kostnaden för att utveckla vårdprogrammet var intjänad redan efter tre patienter. Ingen återinläggning inom 30-dagar förekom i någon av grupperna och ett-års överlevnaden var lika i båda grupperna.

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REFERENCES

- Archibald G. Patient's experience of hip fracture. *Journal of Advanced Nursing* 2003; 44:385-392
- Ardery G, Herr K, Hannon BJ, Titler MG. Lack of opioid administration in older hip fracture patients. *Geriatric Nursing* 2003; 24:353-360
- Alexandersson M. Den fenomenografiska ansatsens fokus. Eds: Starrin B and Svensson PG *Kvalitativ metod och vetenskapsteori*. Studentlitteratur Lund 1994
- Ashworth P, Björn A, Dechanoz G, Delmotte N, Farmer E, Bulanda-Kordas A, Kristiansen E, Kyriakidou H, Slajmer-Japelj M, Sorvettula M Stankova M. *People's need for nursing care. A European study*. World Health Organization, Regional Office for Europe, Copenhagen 1987
- Autier P, Haentjens P, Bentin J, Ballion JM, Grivegnée AR, Closon MC, Boonen S. Costs induced by hip fractures: a prospective controlled study in Belgium. *Osteoporosis International* 2000; 11:373-380
- Bank PB. Before the last leaves fall: sibling connections among the elderly. *Journal of Geriatric Psychiatry* 1995; 28:183-195
- Bergh I, Gunnarsson M, Allwood J, Odén A, Sjöström B, Steen B. Descriptions of pain in elderly patients following orthopaedic surgery. *Journal of Advanced Nursing* 2005a; 19:110-118
- Bergh I, Jakobsson E, Sjöström B, Steen B. Ways of talking about experiences of pain among older patients following orthopaedic surgery. *Journal of Advanced Nursing* 2005b; 52:351-361
- Bowman A-M. Sleep satisfaction, perceived pain and acute confusion in elderly clients undergoing orthopaedic procedures. *Journal of Advanced Nursing* 1997; 26:550-564
- Burns N, Grove SK. *The practice of nursing research. – Conduct, critique and utilization*. (3rd ed) W.B. Saunders company. Philadelphia, Pennsylvania U.S.A. 1997 p 265-271
- Braithwaite RS, Nanada FC, Wong JB. Estimating hip fracture morbidity, mortality and costs. *Journal of American Geriatric Society* 2003; 51:364-370

- Campbell H, Hotchkiss R, Bradshaw N, Porteous M. Integrated care pathways. *British Medical Journal* 1998; 316:133-137
- Carnevali DL. *Diagnostic reasoning and treatment decision making in nursing* Philadelphia: J.B. Lippincott company 1993 p. 39-75
- Ceder L, Thorngren KG, Walldén B. Prognostic indicators and early home rehabilitation in elderly patients with hip fractures. *Clinical Orthopaedics* 1980; 152:173-184
- Cheah J. Development and implementing of a clinical pathway programme in acute care general hospital in Singapore. *International Journal for Quality in Health Care* 2002; 12:403-412
- Chester F. Care pathways: Tools for clinical audit? *Audit trends* 1996; 4:73-75.
- Chick N, Meleis AI. Transitions: A nursing concern. In PL Chinn (Ed.), *Nursing research methodology: Issues and implementation*. Rockville, MD: Aspen 1986 p. 237-257
- Choong PFM, Langford AK, Dowsey MM, Santamaria NM. Pathway for fractured neck of femur: a prospective, controlled study. *The Medical Journal of Australia* 2000; 172:423-6.
- Closs SJ. Pain and elderly patients: a survey of nurses' knowledge and experiences. *Journal of Advanced Nursing* 1996; 23:237-242
- Coffey RJ, Richards JS, Remmert CS, LeRoy SS, Schoville RR, Baldwin PJ. An introduction to critical paths. *Quality Management in Health Care* 1992; 1: 45-54
- Cooper C. The crippling consequences of fractures and their impact on quality of life. *The American Journal of Medicine* 1997; 103:12-19
- Cooper C, Campion G, Melton LJ. Hip fractures in the elderly: a world- wide projection. *Osteoporosis International* 1992; 2:285-289
- Curry-Cox L, Hogstel MO, Davies GC. Functional status in older women following hip fracture. *Journal of Advanced Nursing* 2003; 42:347-354
- Crummer MB, Carter V. Critical Pathways – The pivotal tool. *Journal of Cardiovascular Nursing* 1993; 7:30-37

- Donabedian A. Evaluating the quality of medical care. *Milbank Memorial Fund Quarterly* 1966; 44:166–206
- Dowsey MM, Kilgour ML, Santamaria NM, Choong PF. Clinical pathways in hip and knee arthroplasty: a prospective, randomised controlled study. *The Medical Journal of Australia* 1999; 170:59-62
- Drummond MF, O'Brien B, Stoddart GL, Torrance GW. *Methods for the Economic Evaluation of Health Care Programmes* (2nd ed) Oxford Medical Publications, Oxford University Press, Oxford New York, Toronto 1997 p. 96-131
- Egan M, Wairen SA, Hessel PA, Gilewish G. Activities of daily living after hip fracture: Pre- and post discharge. *The Occupational Therapy Journal of Research* 1992; 12:342-356
- Ehrenberg A, Ekman I, Ehnfors M. Older patients with chronic heart failure within Swedish community health care: A record review of nursing assessments and interventions. *International Journal of Clinical Nursing* 2004; 13:90-96
- Ek A-C, Unosson M, Bjurulf P. The modified Norton scale and the nutritional state. *Scandinavian Journal of Caring Sciences* 1989; 3:183-187
- Ekman I, Cleland JCF, Swedberg K, Charlesworth A, Metra M, Poole-Wilson PA. Symptoms in patients with heart failure are prognostic predictors. Insights from COMET, *Journal of Cardiac Failure* 2005a; 11:288-292
- Ekman I, Cleland JG, Andersson B, Swedberg K. Exploring symptoms in chronic heart failure. *European Journal of Heart Failure*. 2005b; 7:699-703
- Finlayson D. Commentary of The current hospital costs of treating hip fractures. *Injury* 2005; 36:92
- Folland S, Goodman AC, Stano M. *The Economics of Health and Health Care* (4th ed) Prentice Hall, Upper Saddle River, New Jersey 2004
- Gholve KA, Kosygan KP, Sturdee SW, Faraj AA. Multidisciplinary integrated care pathway for fractured neck of femur: A prospective trial with improved outcome. *Injury* 2005; 36:93-98

- Haentjens P, Autier P, Barette M, Boonen S. The economic cost of hip fractures among elderly women: a one-year, prospective, observational cohort study with matched-pair analysis. *Journal of Bone and Joint Surgery* 2001; 83: 493-500
- Hagsten B, Svensson O, Gardulf A. Health-related quality of life and self-reported ability concerning ADL and IADL after hip fracture. *Acta Orthopaedica* 2006; 77:114-119
- Hallström I, Elander G, Rooke L. Pain and nutrition as expected by patients with hip fracture. *Journal of Clinical Nursing* 2000; 9:639-646
- Hampton D. Implementing a managed care framework through care maps. *Journal of Nursing Administration* 1993; 23:21-27
- Hedlund R. *Incidence of femur fractures*. [Dissertation]. Karolinska institutet, Stockholm Sweden 1985
- Henriksson, C. *Living with fibromyalgia. A study of consequences for daily activities*. [Dissertation]. Linköping University, Linköping, Sweden 1995
- Hofland SL. Elder beliefs: blocks to pain management. *Journal of Gerontological Nursing* 1992; 18:19-23
- Hälso- och Sjukvårdslagen, (HSL) *SFS 1982:763* Stockholm: Norstedts Tryckeri AB 1982
- Jewell SE. Elderly patients' participation in discharge decision-making: *British Journal of Nursing* 1996; 2:1065-1071.
- Johansson I. *Quality of care and assessment of health among elderly in acute care*. [Dissertation] Linköping University, Linköping, Sweden 1998
- Johnell O. The socioeconomic burden of fractures: today and in the 21st century. *The American Journal of Medicine* 1997; 103:20–25
- Johnell O, Kanis JA. An estimate of the worldwide prevalence, mortality and disability associated with hip fracture. *Osteoporosis International* 2004; 15:897–902
- Johnell O, Kanis JA. Epidemiology of osteoporotic fractures. *Osteoporosis International* 2005; 16:3–7

- Kanis JA, Oden A, Johnell O, De Laet C, Jonsson B, Oglesby AK. The components of excess mortality after hip fracture. *Bone* 2003; 32:468–473
- Katz S, Ford A, Moskowitz R, Jackson B, Jaffe M. Studies of illness in the aged. The index of ADL: A standardized measure of biological and psychological function. *Journal of American Medical Association* 1963; 185:94-99.
- Kihlgren A. *Older patients in transition – from home care towards emergency care*. [Dissertation] Karolinska Institutet, Stockholm, Sweden 2005
- Kobelt G. *Health economics: an introduction to economic evaluation*. (2nd ed)12 Whitehall London 2002 p. 56-72
- Koval KJ, Skovron ML, Polatsch D, Aharonoff GB, Zuckerman JD. Dependency after hip fracture in geriatric patients: a study of predictive factors. *Journal of Orthopaedic Trauma* 1996; 8:531-535
- Koval KJ. A clinical pathway for hip fractures in the elderly. *Techniques in Orthopaedics*. 2004; 19:181-186
- Kralik D, Visentin K, van Loon A. Transition: a literature review. *Journal of Advanced Nursing* 2006; 55:320-329
- Kvale S. *Den kvalitativa forskningsintervjun*. Studentlitteratur, Lund 1997 p. 117-126
- Kwan J, Hand P, Dennis M, Sandercock P. Effects of introducing an integrated care pathway in an acute stroke unit. *Age and Ageing* 2004; 33:362-367
- Källström L. *Effektivitet i SU-sjukvården – Granskningsresultat av vårdkedjestudie våren 2000*. Revisionsenheten för Västra Götaland i Vänersborg Komrev AB, september 2000
- Larsson S. *Kvalitativ analys av exemplet fenomenografi*. Studentlitteratur, Lund 1986 p. 5
- Larsson-Lund M, Tamm M, Bränholm I-B. Patients' perceptions of their participation in rehabilitation planning and professionals' view of their strategies to encourage it. *Occupational Therapy International* 2001; 8:151–167
- Larsson M, Rundgren Å. *Geriatrisk vård och specifik omvårdnad*. Studentlitteratur, Lund 1997 p. 89-92

- Latham NK, Jette DU, Warren RL, Wirtalla C. Pattern of functional change during rehabilitation of patients with hip fractures *Archives of Physical Medicine and Rehabilitation* 2006; 87:111-116
- Lawrence TM, White CT, Wenn R, Moran CG. The current hospital costs of treating hip fractures. *Injury* 2005; 36:88-91
- Marottoli RA, Berkman LR, Cooney LM. Decline in physical function following hip fracture. *Journal of the American Geriatrics Society* 1992; 40:861-866
- Marton F. Phenomenography: Describing conceptions of the world around us. *Instructional Science* 1981; 10:177-200
- Meleis AI, Trangenstein PA. Facilitating transitions: redefining of the nursing mission. *Nursing Outlook* 1994; 42:255-259
- Meleis AI, Sawyer LM, Im E-O, Messias DKH, Schumacher K. Experiencing Transitions: An emerging middle-range theory. *Advances in Nursing Science* 2000; 23:12-28
- Morris AH, Zuckerman JD. National consensus conference on improving the continuum of care for patients with hip fracture. *The Journal of Bone and Joint Surgery* 2002; 84-A: 670-674
- Morrison RS, Magaziner J, McLaughlin MA, Oroz G, Silberzweig SB, Koval KJ, Siu AL. The impact of postoperative pain on outcomes following hip fracture. *Pain* 2003; 103:303-311
- Nikolaus T, Specht-Leible N, Bach M, Oster P, Schlierf G. A randomized trial of comprehensive geriatric assessment and home intervention in the care of hospitalized patients. *Age and Ageing*. 1999; 28:543-550
- Nyström M. *Möten på en akutmottagning: om effektivitetens vårdkultur*. Studentlitteratur Lund 2003
- Overend TJ, Mackenzie Chesworth B, Sandrin M, Stroud S, Petrella RJ, McCalden R. Determination of prefracture physical function in community-dwelling people who fracture their hip. *Journal of Gerontology* 2000; 55: 698-702

- Parker MJ, Handoll HHG, Dynan Y. Mobilization strategies after hip fracture surgery in adults (Cochrane Review). *The Cochrane Library*, Issue 4, 2002. Oxford: Update Software
- Petryshen PR, Patryshen PM. The Case management model: an innovative approach to the delivery of patient care. *Journal of Advanced Nursing* 1992; 17:188-1194
- Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *Journal of American Geriatrics Society* 1975; 23:433-441
- Polit DF, Hungler BP. *Nursing Research Principles and methods*. 5th edition Lippincott Company Philadelphia 1995 p 168-175
- Roberts HC, Pickering RM, Onslow E, Clancy M, Powell J, Roberts A, Hughes K, Coulson D, Bray J. The effectiveness of implementing a care pathway for femoral neck fracture in older people: a prospective controlled before and after study. *Age and Ageing* 2004; 33:178-184
- Robinson SB. Transitions in the lives of elderly women who have sustained hip fractures. *Journal of Advanced Nursing* 1999; 30:1341-1348
- Rumble S, Jernigan M, Rudisill PT. Determining the effectiveness of critical pathways for coronary artery bypass graft patients: retrospective comparison of readmission rates. *Journal of Nursing Care Quality* 1996; 11:34-40
- Sahlsten MJ, Larsson IE, Lindencrona CS, Plos KA. Patient participation in nursing care: an interpretation by Swedish registered nurses. *Journal of Clinical Nursing* 2005; 14:35-42
- Salkeld G, Cameron ID, Cumming RG, Easter S, Seymour J, Kurrle SE, Quine S. Quality of life related to fear of falling and hip fracture in older women: a time trade off study. *British Medical Journal* 2000; 320:341-345
- Schumacher KL, Jones PS, Meleis AI. Life transition in the older adults. Chapter 1 *Helping elderly in transition: A framework for research and practice*. Advances in Gerontological Nursing, Springer publishing company New York, 1999 p 11-26
- Schürch MA, Rizzoli R, Memillod B, Vassey H, Michel JP, Bonjour JP. A prospective study on socioeconomic aspects of fracture of the proximal femur. *Journal of Bone and mineral Research* 1996; 11:1935-1942

- Sernbo I, Johnell O. Consequences of a hip fracture: a prospective study over 1 year. *Osteoporosis International* 1993; 3:148–153
- Simpson P. Clinical outcome in transition program for older adults with hip fracture. *Outcomes Management*. 2002; 6:86-92
- Socialstyrelsen 2003 (National Board of Health and Welfare). *Socialstyrelsens riktlinjer för vård och behandling av höftfraktur*. www.sos.se/plus/skrift.html
- Sonn U. *Longitudinal studies of dependence in daily life activities among the elderly. Methodological development, use of assertive devices and relation to impairments and functional limitations*. [Dissertation]. Göteborg University, Göteborg Sweden 1995
- Statistiska centralbyrån (SCB). *Statistisk årsbok för Sverige*. Stockholm Sweden 1997
- Styrborn K. Early discharge planning for elderly patients in acute hospitals: an intervention study. *Scandinavian Journal of Social Medicine*. 1995; 23:273-285
- Socialstyrelsen *Kvalitetssystem i hälso- och sjukvården*. Socialstyrelsens föreskrifter och allmänna råd. 1996 *SOSFS* 1996:24 Stockholm
- Sonn U, Åsberg Hulter K, Hultin G, Mellström D, Zetterberg C. ADL-förmågan förutsäger vårdtiden. *Läkartidningen* 1994; 91:2962-2963.
- Statens Offentliga Utredningar. *Patienten har rätt*. Delbetänkande av kommittén om hälso- och sjukvårdens finansiering och organisation (*SOU 1997:154*) Stockholm: Fritzes.
- Strömberg L. *Hip fractures in the elderly: Social, economic and psychological aspects of rehabilitation*. [Dissertation], Karolinska institutet, Stockholm, Sweden 1998.
- Söderhamn O. *Potential for self-care. Assessing and describing self-care ability among elderly people*. [Dissertation]. Linköping University, Linköping Sweden 1998.
- Søreide O, Alho A, Riitti D. Internal fixation versus endoprosthesis in the treatment of femoral neck fractures in the elderly. A prospective analysis of the comparative costs and the consumption of hospital resources. *Acta Orthopaedica Scandinavia* 1980; 51:827-831

- Tarling M, Aitken E, Lahoti O, Randall J, Skeete M, Wozniak R, Hendrie O, Hendrie T. Closing the loop: the role of a pilot in the development of a fractured neck of femur integrated care pathway. *Journal of Orthopaedic Nursing*. 2002; 6:130-134
- Thorngren KG. *State of the art - Höftfraktur*. Stockholm: Socialstyrelsen 2002 <http://www.sos.se/mars/sta016/sta016.htm>.
- Thorngren KG Rikshöft/SAHFE. *Årsrapport 2003*. Stockholm: Socialstyrelsen 2004 <http://www.sos.se/mars/kva008/k08.htm>.
- Walker JM, Akinsanya JA, Davies BD, Marcer D. The nursing management of elderly patients with pain in the community: study and recommendations. *Journal of Advanced Nursing* 1990; 15:1154-1161
- Walsh M. Will critical pathways replace the nursing process? *Nursing Standard* 1997; 11:39-42.
- Wenestam C-G. The phenomenographic method in health research. In *Qualitative methods in service of health* (Fridlund B. and Hilding C. ed.), Studentlitteratur, Lund. 2000 p 97-115
- Zander K. Toward a Fully-Integrated Caremap and Case Management System. *New Definition* 1993; 8: 25-27.
- Zander K. Historical development of outcomes-based care delivery. *Critical Care Nursing Clinics of North America* 1998; 10:1-11.
- Zetterberg C, Gneib C, Mellström D, Sundh V, Zidén L. Rikshöft – utvärdering av fysisk funktion och vårdkonsumtion efter höftfraktur. *Läkartidningen* 1990; 23:2040-2045.
- Zuckerman JD, Koval KJ, Aharonoff GB, Hiebert R, Skovron ML. A functional recovery score for elderly hip fracture patients: Development. *Journal of Orthopaedic Trauma* 2000a; 14:20-25
- Zuckerman JD, Koval KJ, Aharonoff GB, Hiebert R, Skovron ML. A functional recovery score for elderly hip fracture patients: Validity and reliability. *Journal of Orthopaedic Trauma* 2000b; 14:26-30
- Öberg, U. *Functional assessment system of lower-extremity dysfunction*. [Dissertation] Linköping University, Linköping, Sweden 1996

Öberg P. *Livet som berättelse. Om biografi och åldrande.* [Dissertation],
Uppsala University, Uppsala, Sweden, 1997

DISSERTATIONS

FROM THE INSTITUTE OF HEALTH AND CARE SCIENCES,

THE SAHLGRENSKA ACADEMY, GÖTEBORG UNIVERSITY, SWEDEN

Doctoral theses

Skärsäter, I. (2002). The importance of social support for men and women, suffering from major depression – a comparative and explorative study.

Ahlberg, K. (2004). Cancer-Related Fatigue – experience and outcomes.

Drevenhorn, E. (2006). Counseling patients with hypertension at health centres – a nursing perspective.

Licentiate thesis

Moene, M. (2006). Samtal inför ett kirurgiskt ingrepp. [The conversation prior to surgery].