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TOTAL KNEE REPLACEMENT: A PROTOCOL REVIEW REGARDING PHYSIOTHERAPY

School of Social Services and Health Care
Degree Programme in Physiotherapy

2007

TOTAALIPOLVIPROTEESI: PROTOKOLLA TARKASTELU KOSKIEN FYSIOTERAPIA

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2007
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Avainsanat: Totaalipolviproteesi, näyttöön perustuva tieto, preoperatiivinen fysioterapia, postoperatiivinen fysioterapia

Tämän tutkimuksen tarkoituksena oli selvittää, mitä näyttöön perustuvaa tietoa on pre- ja postoperatiivisesta fysioterapiasta potilailla, joille on tehty totaalipolviproteesileikkaus. Toisena tarkoituksena oli dokumentoida pre- ja postoperatiivista fysioterapiaa Satakunnan keskussairaalassa.

Tämä tapaustutkimus koostui kirjallisten lähteiden etsinnästä relevanteista tietokannoista sekä sairaalassa tehtyjen havainnointien analysoinnista. Lähteinä käytettiin neljää systemaattista kirjallisuuskatsausta sekä yhtätoista satunnaisesti kontrolloitua kokeellista tutkimusta. Sairaalassa observoitiin neljäntoista totaalipolviproteesipotilaan fysioterapiaa. Potilaista neljä oli pretoperatiivisessa vaiheessa ja kymmenen postoperatiivisessa vaiheessa. Tulokset tulkittiin asiaa selvittävän analyysin avulla.

Kirjallisen tutkimuksen mukaan kuudesta kahdeksan viikon preoperatiivisella harjoittelutavalla ei ole vaikutusta liikerataan, kävelyn nopeuteen tai lihasvoimaan. Preoperatiivinen ohjaus ei myöskää auta vähentämään muutoksia kivun määrässä. Vähennä myöskään sairaalassa vietettyjen päivien määrää postoperatiivisessa hoidossa. Preoperatiivisella ohjauksella on kuitenkin hyödyllinen vaikutus sen laskiessa preoperatiivistä ahdistusta.

Aikaisella mobilisaatiolla postoperatiivisessa hoidossa on hyödyllinen vaikutus palautumiseen postoperatiivisessa hoidossa. Yleisessä käytännössä on tärkeää aloittaa polven liikeharjoittelut sängyssä ja sängyn ulkopuolella niin pian kuin on mahdollista operaation jälkeen. Moni tutkimus tukee käsitystä jossa on tarve selkeälle ja ytimekkäälle fysioterapian hoitotyön prosessille akuutissa sairaala vaiheessa. Fysioterapian hoidon hyödyt saattavat lyhentää sairaalassa olo aikaa ja näin ollen vähentää sairaala maksujen määrää per potilas.

Preoperatiivista fysioterapiaa annettiin poliklinikkakäynnillä. Käynti koostui potilaan nykytilan kartoituksesta ja potilasohjauksesta. Postoperatiivinen fysioterapia sisälsi potilaan ohjausta ja terapeuttista harjoittelua.

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November 2007
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Pages: 91

Keywords: Total knee replacement, evidence-based knowledge, preoperative physiotherapy, postoperative physiotherapy

The purpose of this study was to document the current preoperative and postoperative physiotherapy conducted in Satakunnan Keskussairaala and to find out what the evidence-based knowledge is in regards to the preoperative- and acute (hospital phase) postoperative physiotherapy for patients undergoing a total knee replacement operation.

This case study consisted of literature search from relevant databases and analysis of the observations conducted at the hospital. At the hospital the physiotherapy of fourteen primary total knee replacement patients were observed. Four patients were in the preoperative stage and ten patients were in the postoperative stage. Exploratory analysis was used to interpret the data collected.

According to the literature search there is currently no evidence to support a six to eight weeks preoperative training regime when it comes to enhancing range of motion, walking speed and muscle strength. Pre-operative education does not seem to help improve levels of pain or function either. Nor does it help on decreasing the days spent at the hospital post surgery. Preoperative education has however moderate beneficial effect on decreasing preoperative anxiety.

Early mobilization post surgery seems to have a beneficial effect on recovery post operation. There is also a general agreement that it is important to start training both in bed and out of bed as early as possible. Several studies support the notion that there is a need for a clear and concise clinical pathway describing the physiotherapy process in the acute hospital phase. The benefit of such a pathway might be a shorter hospital stay and hence a decrease in the amount of money cumulated by each patient.

The preoperative policlinic visit included assessment of the patient's current condition, patient education and patient information and sharing. Postoperative physiotherapy included gait training as well as therapeutic exercises.

TABLE OF CONTENTS

LIST OF SYMBOLS AND TERMS

- **Arthroplasty:** is a surgical procedure performed to a diseased joint (Martin, E.A. 2002 p.51).
- **Total knee replacement (TKR) or -Arthroplasty (TKA)** is a surgical reconstruction procedure where the distal head of the femur and the proximal head of tibia are replaced by metal implants (Martin, E.A. 2002 p.51).
- **NSAIDs** are **"**non-steroidal anti-inflammatory drugs". They consist of a large range of drugs often prescribed for different kinds of arthritis'. The drugs reduce inflammation, control pain, swelling and stiffness" (Martin, E.A. 2002 p.473).
- **Anaesthesia** is a procedure most often used during a surgical procedure. Anaesthesia blocks all feeling including pain (American Society of Anesthesiologists (ASA) 2004).
- **General anaesthesia** is a medical procedure that affects the patient in such a way that he or she is put to sleep / loose consciousness and hence will have no sensation of pain (ASA 2004).
- **Regional anaesthesia** is a medical procedure that removes pain and sensation from parts of the body (e.g. the lower limb). It differs from local anaesthesia in the way that if affects a larger area The patient is conscious during this procedure (ASA 2004)
- **Epidural analgesia** is a medical procedure also called an epidural block. It provides the patient with some sensation loss in the lower limbs. The epidural analgesia is inserted into the epidural space with the help of an epidural needle followed by a catheter. The medication can be given continuously or in small doses to reduce pain or discomfort. The patient is awake and alert (ASA 2004)
- **Spinal analgesia** or spinal block is a medical procedure that numbs the lower part of the patients body. More specifically it is an injection into the spinal fluid. It is fast working and short lasting (1-2 hours). The spinal block uses a smaller amount of drugs compared to the epidural analgesia and it is injected in the same place but with a much thinner needle (ASA 2004).
- **Spinal anaesthesia** is more or less the same procedure as spinal analgesia. The only difference is that spinal anaesthesia uses a much stronger dose of medication and therefore provides the patient with a better pain relief (ASA 2004)

1 INTRODUCTION

The idea for this thesis arose when I was at a clinical placement in Kristinestad in the Western part of Finland. At this placement I worked a lot with Swedish speaking total hip and knee replacement patients in all stages of the rehabilitation process. During this placement I got to understand that there were a lot of different approaches to how the rehabilitation of total knee replacement were performed at different hospitals in the region and hence I started to work with the idea of maybe writing a thesis on this topic.

When I asked the school about the possibility of writing on this topic I found out that Satakunnan Keskussairaala would be interested in having a student writing on this topic because they did not have a written record of their protocols for pre-operative and post-operative physiotherapy. The main reason why I decided to write about this was that I thought it would be challenging and interesting to see if I could figure out what is a good way to do the physiotherapy. I also wanted to know if the physiotherapy currently used in Satakunnan Keskussairaala was up to date.

There are several benefits that can be gained by this bachelor thesis. Among others the hospital can benefit from updated information about the rehabilitation process seen from the physiotherapists view, what type of pre operative physiotherapy can be used and what type post operative physiotherapy can be applied in the hospital phase. On a personal level I will gain a deeper understanding of the different approaches and I will learn a lot about the process of writing a scientific work.

In the late autumn of 2006 I approached the hospital and we made an agreement with the school and me on how to proceed. We talked about what specifications they wanted and what I could deliver.

2 TOTAL KNEE REPLACEMENT

According to the National Institute for Clinical Excellence (2005) degenerative arthritis or osteoarthritis of the knee is the most common reason for total knee replacement (TKR) or total knee arthroplasty (TKA).

Total knee replacement is a surgical reconstruction procedure where the distal head of the femur and the proximal head of tibia are replaced by metal implants (figure 1). The functions of the menisci are reproduced by a polyethylene implant that is attached to the tibial component. The polyethylene implant also reduces wear of the metal components (About Joints, 2007; New Zealand National Joint Register, 2004; Hammesfahr, J.F.R., 2001).

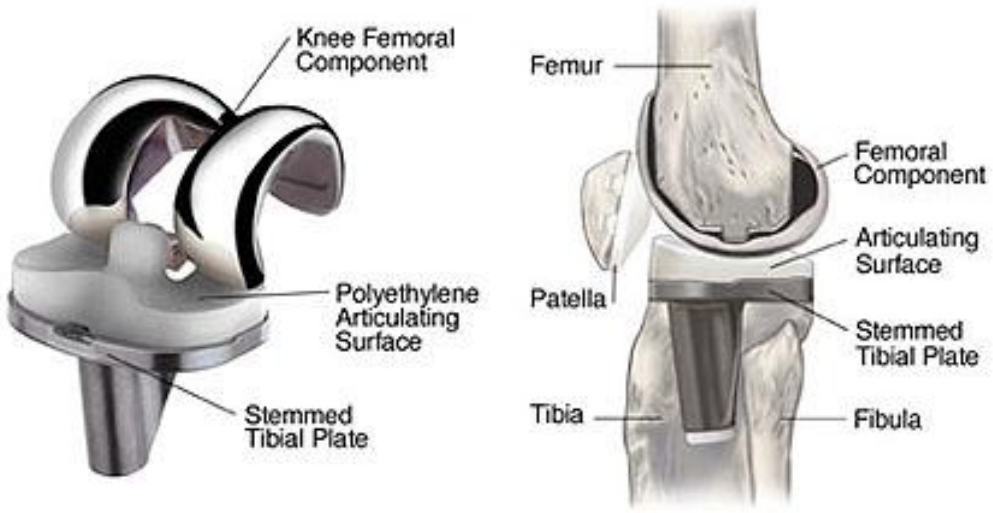


Figure 1: The three components of a primary total knee replacement ("Images © Zimmer, Inc. Used by permission only.") (Appendix 03).

It is believed that the first arthroplasty because of arthritis was performed in the 1860s by a man named Fergusson. The first total arthroplasties began to appear in the 1950's (Palmer and Cross, 2007). Total knee replacement is a safe and in most cases a very good operation for people having severe osteoarthritis or rheumatoid arthritis of the knee due to the relief of pain and the increase of range of motion that most people experience after an operation. (Jordan et al. 2003)

2.1 Osteoarthritis of the knee

Advanced osteoarthritis is the most common cause for total knee replacement. It is also an important reason for consulting the general practitioner in older adults. It is believed that the reason for getting osteoarthritis is a combination of several factors and that it is not caused by one entity alone (Peat et al. 2001).

In the knee of a normal healthy person the surfaces of the knee joint is covered with articular cartilage. This cartilage works as a shock absorber. It does also provide low friction between the components of the knee. In an arthritic knee the articular cartilage is either worn or torn away. When this happens the patient often experiences pain and problems in performing normal activities of daily living (Jordan, 2001). These findings are also supported by Jordan et al. (2003). They continue to say that the problems associated with osteoarthritis will reduce the quality of life of the patients and it might also increase the risk for other sickness related problems and some times even result in death.

There are two normal ways of assessing osteoarthritis of the knee. Firstly it is the standard diagnostic way where the specialist defines the severity and the extent of the problem by the help of a thorough medical interview and a clinical examination. Secondly it is the radiographic investigation by x-ray and MRI. (Peat et al. 2001) Hochberg et al. (1995) have used the same idea to make a classification form to identify osteoarthritis of the knee. The classification criteria which are used for osteoarthritis of the knee are as following: Pain in the knee and the finding of osteophytes in radiographic tests or pain in the knee and an age of more than or equal to 40 years and morning stiffness less than or equal to 30min in duration and motion crepitus

Conservative treatment of osteoarthritis should normally be tried before a TKR is performed. Treatment of osteoarthritis of the knee normally consists of three types of therapy: nonpharmacological, pharmacological and invasive interventions. Firstly the nonpharmacological treatment might contain such things as: physiotherapy, health promotion, patient education, home exercise programs and lifestyle changes.

Secondly the pharmacological treatment might consist of treatment with NSAIDs, paracetamol, medications applied directly to the skin and opioid- or non-opioid analgesia. Last the invasive interventions mainly focus on intra-articular injections, lavage and joint replacement (Jordan et al. 2003; Hochberg et al. 1995).

2.2 Surgery

There are several different options when it comes to total knee replacement surgery. The type of operation the patient will undergo, what type of prosthesis the patient will receive and the type of fixation used is mostly dependent on in which country and in what hospital the surgery is performed (Finnish Arthroplasty Register, 2006; Norwegian Arthroplasty Register, 2006; Australian Orthopaedic Association, 2006).

The most common prostheses used in Finnish hospitals for total knee replacement is the Duracon prosthesis. 34,4% of all prosthesis inserted in 2004 was of this brand. The second and third most common prosthesis were the AGC V2 and the P.F.C Sigma with respectively 14,5% and 14,2% (Finnish Arthroplasty Register, 2006). According to the Finnish Arthroplasty Register (2006) there have been inserted 138 different types of prostheses in the years from 1990 to 2004.

2.2.1 Incidence of total knee replacements

The incidence of total knee replacement surgery is in general very much the same in the Northern part of Europe. Even though the numbers of citizens in these countries vary the incidence number of total knee replacement surgery stay more or less the same. Finland is the only of the three northern countries (Norway, Sweden and Finland) that have a higher incidence number in comparison to the others.

According to Nasjonalt Register for Leddproteser (2007) the incidence of primary knee replacement surgery in 2003 was 67 persons per 100,000 inhabitants. In Sweden they performed 8,736 primary total knee replacements and 912 primary unicompartmental knee replacements (The Swedish Knee Arthroplasty Register,

2006). That gives Sweden the same incidence number as Norway: 67 persons per 100,000 inhabitants (Appendix 04).

In 2004 6,873 total knee replacements were performed in Finland (Finnish Arthroplasty Register, 2006). That gives an incidence of 132 persons per 100,000 inhabitants (Appendix 05). This is clearly a much higher number of arthroplasties performed in comparison to the other two Nordic countries.

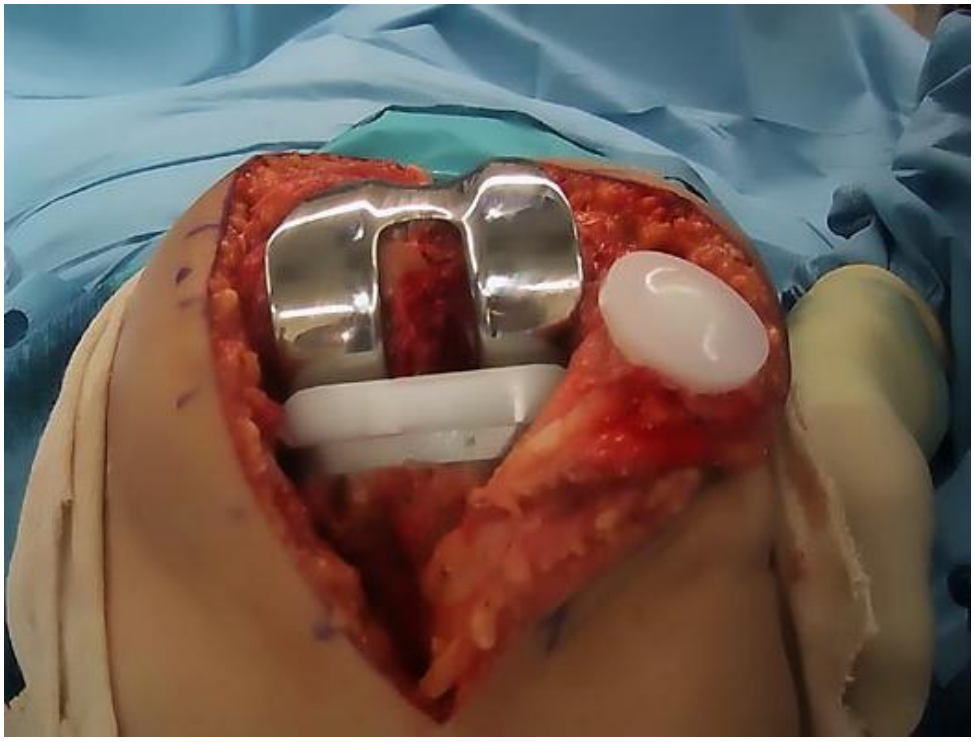
2.2.2 Traditional total knee replacement surgery using the Duracon Total Knee System

The patients can normally choose between two types of anaesthesia when they go through an operation (spinal anaesthesia or epidural anaesthesia). Spinal anaesthesia is however the most commonly used for patients undergoing total knee replacement surgery at the hospital in Pori (appendix 12).

The first thing that the surgeon will do is to make a midline incision alongside of the patella to surgically expose the joint. The incision is made under tourniquet control. Once the joint is fully exposed he or she will start working on cutting the bones so that the prosthesis parts will fit perfectly. The surgeon will normally start working on the head of femur and then move on to cutting the tibia (About Joints 1998). The midline incision is according to the University of Washington (2006) normally 20 to 25cm in traditional total knee replacement.

When the bones are properly cut and adjusted to the parts, the prosthesis will be cemented into place using special bone cement (about 97% of all TKRs in Finland in 2004 had cement as a fixation technique according to the Finnish Arthroplasty Register (2006)). The surgeon often uses a technique where he releases the tourniquet before closing to make sure of proper patello-femoral tracking and to achieve haemostasis (About Joints, 1998).

When all components have been tested and are working (picture1) according to what is expected of it the surgeon will close the incision and place a wound drain before wrapping the knee and the surrounding area in post surgery bandages (Wnorowski, D.C., 2007).



Picture 1: Left knee (flexed) after complete resurfacing (Adapted from Wnorowski, 2007).

2.3 Medication

According to Crowley and Fischer (2006) there are five main benefits of regional anaesthesia: Firstly it reduces the incidences of Deep Venous Thrombosis (DVT) and pulmonary embolus (PE) post surgery. Secondly it reduces the blood loss of the patient during surgery. Thirdly it reduces the need of additional post surgery analgesia in comparison to general anaesthesia. Fourthly it increases the acute phase rehabilitation as well as the outcome of the total knee replacement and last it reduces the patient's feelings of nausea as well as the level of vomiting post surgery

Other kinds of medications that are often given in relationship to total knee replacement are low molecular weight heparin (LMWH) and Warfarin. The LMWH

and Warfarin are both administered to prevent thromboembolic disease and works as an anticoagulant treatment or prophylaxis (Crowley and Fischer 2006).

Some elderly patients might experience side effects of the analgesics given through the epidural or through the medication regime that they receive after the removal of the epidural. Side effects such as changes in mental status are not an uncommon problem especially in elderly patients. The patients that experience mental status changes may be seen as confused or uncooperative and that can make physiotherapy difficult. Analgesics that are known to possibly make patients confused or uncooperative should be limited when appropriate and only given on a "need to have" basis (Rasul and Wright 2005).

Rasul and Wright (2005) also states that if blood thinning medications are contraindicated use of intermittent pneumatic stockings or other mechanical devices should be considered. This type of non-medication treatment has proven to be beneficial according to them.

2.4 Complications of total knee replacement surgery

A one year old study performed by the Finnish Arthroplasty Register (2006) suggests that there are 10 main complications associated with primary total knee replacement in Finland (table 1). Even though there are ten complications listed they are only the cause of a less than 1% complication rate.

Wound necrosis	Malposition
Anaesthetic complications	Thromboembolic complication
Nerve injury	Infection
Death	Luxation
Haematoma	Other primary complications

Table 1: Cause of complications in primary TKR in Finland in 2004

Deep Venous Thrombosis (DVT) and pulmonary embolism (PE) are two of several concerns that surgeons and hospital staff may have after performing a total knee replacement. According to the Agency for Healthcare Research and Quality or

AHRQ (2001) the risk of DVT in patients that are not treated by prophylactic methods are 64%. If LMWH or intermittent pneumatic compression (IPC) is applied to these patients the reduction is stated to be 52% for those receiving LMWH and 73% for those receiving IPC.

Infection is another complication that might cause severe complications and even death post TKR. According to the American Academy of Orthopaedic Surgeons or AAOS (2006) the incidence of knee joint infection is less than 2% in those who go through a total knee replacement.

Peersman et al. (2001) reports similar numbers in his study of 6489 total knee replacements. He also lists 7 co-morbidities that in his study showed to be statistically significant for increasing the risk of infection. The seven co-morbidities that they found to be significant were: prior open surgical procedures, immunosuppressive therapy, poor nutrition, hypokalemia, diabetes mellitus, obesity and a history of smoking

Nerve injury and especially palsy of the peripheral nerve is another complication that sometimes occurs after total knee replacement. According to a study made by Schinsky et al. (2001) there are not consensus about the reasons for this type of injury. Furthermore the exact incidence of this type of injury has a low consensus. In their retrospective review however they found the incidence to be 1,3%.

If one look at the complications that resulted in a revision surgery in 2004 more than 50% of all total knee replacement revisions in Finland were caused by four entities alone. The four entities were: infection, malposition of prosthesis, patellar complications and loosening of one or more of the components (Finnish Arthroplasty Register. 2006).

The survivor rate for total knee replacement is in general very good. Finland reports a survival rate of the prosthesis inserted between the years of 1980 to 1987 to be about 77% after 15 years. The newer prosthesis (inserted 1996 to 2004) has shown better promise and is expected to have the same or even better prognosis after 15 years (Finnish Arthroplasty Register. 2006).

3 PHYSIOTHERAPY IN TOTAL KNEE REPLACEMENT

The World Health Organization's (WHO) members did in 2001 endorse the ICF model to conceptualize the area of disability (WHO, 2007). The ICF model is a "new" framework based upon the ICIDH model from 1980. The old model was called the International Classification of Impairments, Disabilities, and Handicaps, or ICIDH. The "new" model has been made to make it easier to measure health and disability on individual and population levels throughout the world. All components in this model can have several categories included within their area of speciality (body functions and structures, activity, participation, environmental and personal factors) (WHO, 2002).

3.1 Total knee replacement physiotherapy in relation to ICF

The ICF model has as an intention to unify health care professionals the world over. The reason for that is the fact that it has provided a common language and system for grading and coding function, disability and health (WHO, 2002).

Total knee replacement is a thorough operation that involves several instances of the multidisciplinary team. The reason for having the multidisciplinary team work so closely is to ensure the patient the best possibilities for a safe and successful recovery (Birch and Price 2003, p.412-419). If we look at the work that the physiotherapist performs in relation to the multidisciplinary team it is possible to see it in relation to the ICF model. The ICF model has been adapted by the researcher to the use for a physiotherapist in table 2.

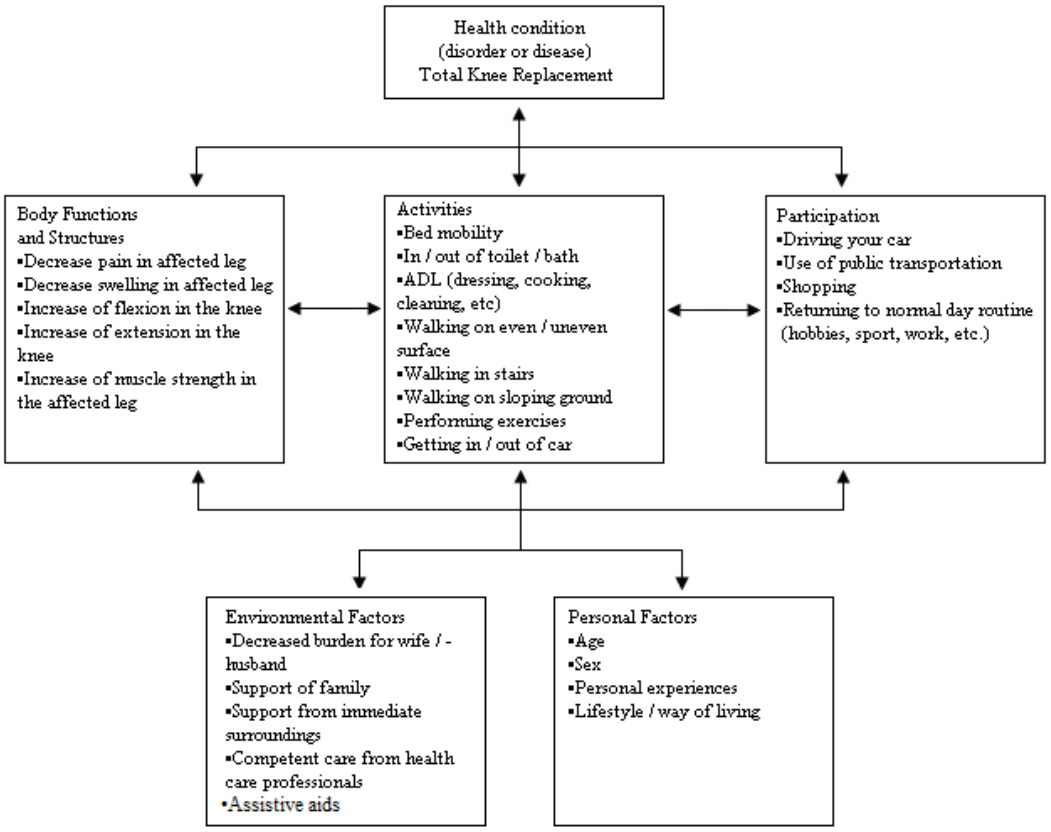


Table 2: ICF model used in the context of total knee replacement (Adapted from WHO 2002)

Physiotherapy rehabilitation of a total knee replacement includes a preoperative visit prior to the surgery as well as postoperative treatment both in the acute hospital phase (days one to five post surgery) and the phase following the acute phase to complete recovery (Birch and Price 2003, p.412-419).

3.2 Preoperative physiotherapy

Preoperatively physiotherapy normally includes a visit to the hospital prior to surgery. At this visit the physiotherapist assesses the patient, gives instruction in use of walking aids, instructions about exercises that the patient need to practice before the operation as well as how to perform them. (Birch and Price 2003, p.414-415) Other things that often are obtained in the preoperative visit are relevant information about the patient's body functions and structures, activities, participation, environmental and personal factors (Birch and Price 2003, p.414-415; Jones et al.

2005). The preoperative visit is also important because it often helps calm down the patient and thereby lessens the anxiety felt by the patient (Birch and Price 2003, p.414).

3.3 Postoperative physiotherapy

The main aims after total knee replacement are to relieve pain, to increase range of motion and to increase the person's perceived quality of life. Another goal should be to increase the functional ability and to prevent further deformation of the joint. The physiotherapist will help the patient to achieve these goals by starting early mobilization and strength training (with focus on regaining quadriceps control) as well as providing the patient with cold treatment, coordinating analgesia and by providing emotional support in the way of reassuring and encouraging the patient (Birch and Price 2003, 412-419).

When it comes to when the patient should start doing the different exercises or when the patient should be taken out of bed there are several options. No direct consensus has been found by the researcher in regard to what should be performed on day one through seven. The research has however looked at different benefits and these will be discussed in a later chapter.

4 EVIDENCE BASED PHYSIOTHERAPY

Evidence based physiotherapy has its routs from evidence based medicine which was introduced at McMaster University in Canada in 1992. It is high quality clinical research performed in the field of physiotherapy. Evidence based physiotherapy is not the only information required for evidence based clinical practice. Other things that may influence are the physiotherapist's professional knowledge and the patient's preferences or the patient's wishes and expectations (Herbert et al. 2005, p.19-48).

Clinical research is research performed in a clinical setting on a patient or a patient group. It is meant to generate knowledge with experiment or observation hence it is

said to be empirical. High quality clinical research is research with results that one can trust to be correct because it has been performed in a way that has low bias (Herbert et al. 2005, p.24).

According to Herbert et al. (2005, p.41-48) systematic reviews provide the best evidence about effects of interventions, prognosis or accuracy of diagnostic tests and experiences. Randomized clinical trials provide the best evidence of effects of interventions and qualitative research provide evidence on experiences. Cohort studies normally provide us with good evidence about prognosis and prognostic information. Cross sectional studies provides evidence of the accuracy of diagnostic tests.

The combination of many clinical trials does provide the absolutely best evidence in comparison to only one individual trial. Hence if one wishes to answer the question of the effectiveness of an intervention one should strive to use several trials to gain the truest picture of the effectiveness of an intervention (Herbert et al. 2005, p.31-33).

Most of the research used in the literature review is systematic reviews, randomised control trials and single randomised control trials. According to Herbert et al (2005, p.19) these types of research provide the best evidence for evidence based physiotherapy.

5 THE AIM OF THE THESIS AND RESEARCH QUESTIONS

The aim of this thesis was to gather information on what the current type of physiotherapy Satakunnan Keskussairaala uses with total knee replacement patients. The focus has been on the preoperative visit (a few weeks before the operation) and the acute phase (day 1-5) postoperatively. A second aim was to gather updated evidence based knowledge in relation to total knee replacement. This thesis has been a project that has been carried out in cooperation with Satakunnan Keskussairaala.

The project's main focus was on two research questions:

1 What is the hospital's protocol regarding preoperative and postoperative physiotherapy in the acute phase (first five days) at the hospital for total knee replacement patients?

2 What is the evidence based knowledge in total knee replacement regarding pre- and post-operative physiotherapy in the hospital phase?

6 QUALITATIVE RESEARCH AND RESEARCH METHODS

Qualitative research is an alternative approach to quantitative research and it is often used by researchers that want to study human behaviour. Qualitative research is said to provide a holistic overview of the context under study as well as offering an insider's view of the context or field. This type of research is often conducted by a researcher following a study object, group, sample, etc. over a shorter or longer period of time (Seale and Bernard 1998, p.8-11).

Qualitative research tries to understand and explain phenomena by using a non-experimental research design. The non-experimental design normally includes several types of research methods (documentary analysis, interview and observation). The data from these research methods need to be interpreted, compared and / or described because they often are spoken words or actions performed by an "outsider" (Seale and Bernard 1998, p.8-11).

This thesis is a case study where qualitative methodology has been used. When speaking about a case study it indicates that the study has been focused on a single case. (Seale and Bernard 1998, p.21) In this thesis it means that it has been used in relationship to physiotherapy applied in total knee replacement.

The data collection method used in this thesis was observation. The choice to use this method came naturally since it provided the researcher a good chance to gain research data about what was being said and done. In addition to seeing and listening to what the physiotherapists did the researcher talked to the physiotherapists and studied documents obtained from the observation site (Seale and Bernard 1998, p.70-73). The role of the researcher was to be a complete observer and hence not interfere with the process at hand. (Domholdt, E. 2000, p.163)

To specify it more the observation technique used in this thesis was semi-structured. A semi-structured observation means that the researcher had some idea of what to observe but that he allowed himself to be flexible and allow for unexpected and

extraordinary events to be recorded as well as the ones ha had already pre-planned (Seale and Bernard 1998, p.71-73).

The ethical issue is also something that is needed to be assessed when using an observational technique in qualitative research. In this thesis the hospital needed to give their consent for me to be able to perform the study (appendix 01 and 02). To avoid legal issues as well as avoiding the patient feeling that his / her privacy was being invaded the patient signed a consent form allowing me to use the observation data recorded in my thesis (appendix 14). Before the patient signed the consent form he / she was given a paper explaining what was going on (appendix 13) (Domholdt 2000, p.163).

In addition to the observations two interviews were used. The reason for using the interviews as well as the semi-structured observation was to get more and deeper information about the rehabilitation process as well as more detailed background material (Seale and Bernard 1998, p.56-58).

7 DESCRIPTION OF THE RESEARCH PROCESS

The study and the interviews were performed by the author with the help of two other physiotherapy students that were doing a similar study regarding total hip replacement at the same time. The protocol was obtained by semi-structured observation and two small interviews. A pilot study was conducted during three days the week prior to the main study to test the checklist used at the main study (appendix 15 and 16). The points used in the pilot study and the main study were based on previous knowledge obtained in clinical practice periods and by literature reviews of relevant articles. The whole process has been simplified and can be seen in table 3.

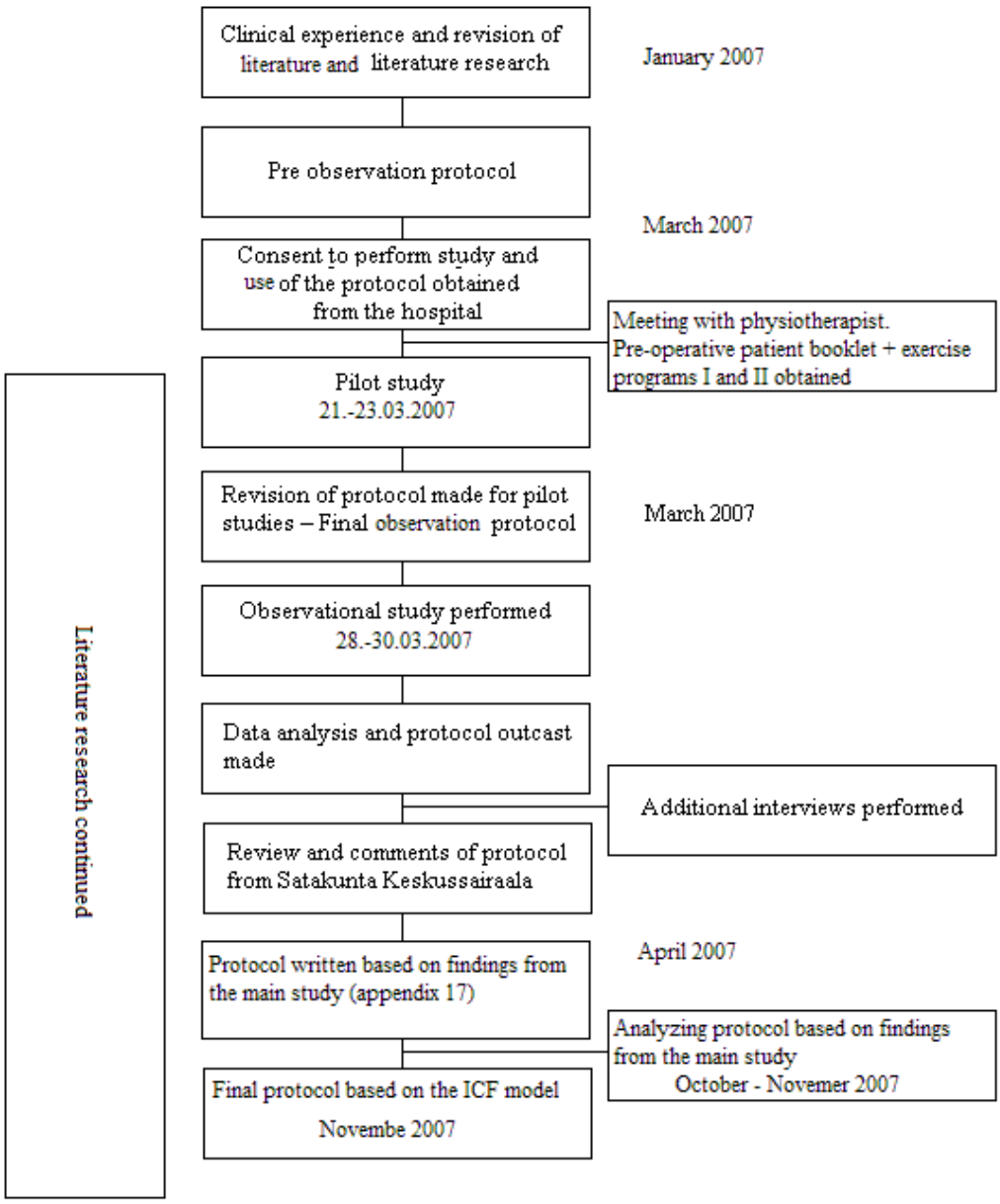


Table 3: Research process explained

As one can see in table 3 a pre observation protocol (appendix 15) was drafted before the actual pilot studies were performed. This research plan was forwarded to the hospital together with a research proposal (2) in February / March 2007. When we got acceptance to perform the study we called up the main coordinator at the hospital and had a discussion / meeting with her. At this meeting we were provided with the patient information booklet (appendix 7) as well as exercise program I and II (appendix 8 and 9).

During the three days the pilot studies (appendix 15) lasted it was discovered that there would be a need to make a few interviews as well to figure out some of the organizational factors of the protocol and to figure out the hospital's policy regarding anaesthesia. When the pilot studies ended there was a short break before the main studies (appendix 16) started. The two interviews were conducted after the main study and can be portrayed in appendix 11 and 12.

When the information from the two interviews as well as the findings from main study was combined a protocol of what was regarded to be the hospitals protocol were made. This protocol was later forwarded to the head physiotherapist of the department for reviews and comments. The protocol was agreed to be correct with two minor corrections (appendix 10). The two corrections were looked at and agreed to be correct and they therefore ended up changing the protocol in a minor way.

The main idea with the observation was to record what was being done and said. The main researcher was in charge of observing what was being done since his Finnish language skills were very limited and it was believed that having one person that kept focus on only one thing would help the study. The two other researchers handled what was being said and taught as well as what was being done.

During the pilot studies as well as the main studies 14 cases were observed (5 cases during the pilot studies and 9 cases during the main studies). Four of the cases were preoperative (2 from the pilot studies and 2 from the main studies) and ten (4 from the pilot studies and 6 from the main studies) were postoperative cases in different stages of the rehabilitation. Because of the limited amount of cases and the similarities in the observations both the results from the pilot studies and the main studies were used in the analysis of the protocol when possible.

When writing up the protocol for the preoperative and the postoperative physiotherapy only the points that appeared in more than 2/3 of the sessions observed were used. If one point appeared in more than 2/3 it was recorded and put to the list of what "is being done". If something appeared once or in less than 1/3 of the observations it was disregarded and not used in the protocol.

An extended literature research was also conducted. The literature used in this thesis were mostly found by conducting different searches in (journal) databases such as ScienceDirect, Elsevier, PEDro, The Cochrane Collaboration and PubMed.

8 DATA ANALYSIS

When analyzing data collected during observation it is important to know how structured or unstructured the observation study was. Typical for data collected in an un-structural way is that it is possible to analyze this data in an exploratory way. The data collected in a very structured way normally needs to be analyzed in a more statistical way (Seale and Bernard 1998 p.144). The semi-structured observations method used in this bachelor thesis was analyzed in a more exploratory way.

Data for the first research question were obtained by going through the checklists (appendix 16) used by all three observers during the main studies as well as analyzing the data collected during the pilot studies. During the main studies and the pilot studies all researchers used the same checklists with specifications to total knee replacement or total hip replacement. At the end of each day when all the observations were over the three researchers gathered in school to go through the data collected on the given day. Each researcher did turns on describing the processes viewed. When one researcher was done the next one explained what he / she had seen heard and in that way we had three individual observation reports that we by the end merged till one. We discussed each point and each observation before moving on to the next and by the end we ended up with a mutual description of what we had seen and heard.

The data were then divided into two factor categories: preoperative physiotherapy and postoperative physiotherapy. After establishing the factor categories there were a branching of the two factor categories into four subcategories (preoperative policlinic visit and day 1, day 2 and day 3 to 5). These subcategories in turn branched into one theme called general information and six theme categories based on the ICF model (health condition (disease disorder), body functions and structures, activities,

participation, environmental factors and last personal factors) (Seale and Bernard 1998, p.144-148). Table 4 explains the analysing process that followed after the observational study.

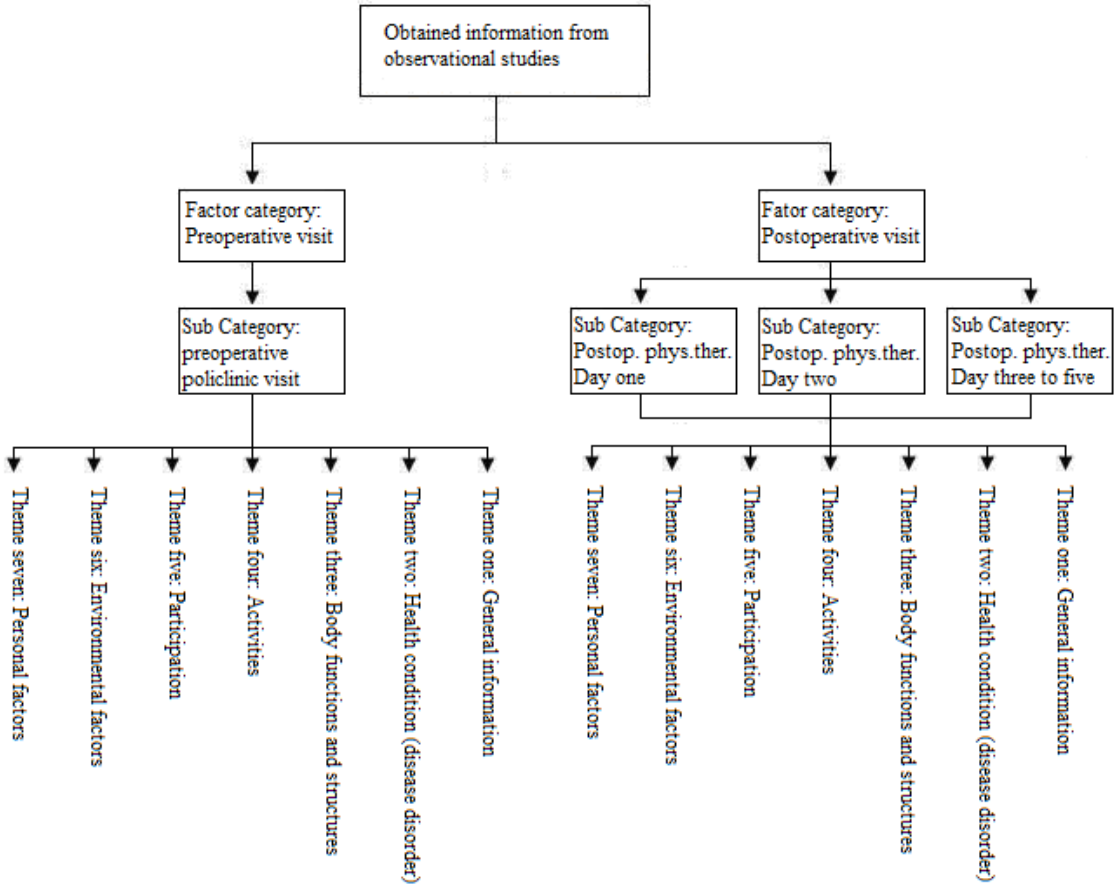


Table 4: Illustration of the analysing process

The data analysis of the second research question was based on the collected research articles that were found during my literature research. The search for relevant and reliable articles was initiated by obtaining and evaluating as many relevant research articles as possible. I have tried to use only new and relevant articles from reliable research sources in this bachelor thesis. According to Seale and Bernard (1998, p.102) the purpose of the data analysis is to interpret the collected information in order to achieve explanations.

9 RESULTS – PREOPERATIVE PHYSIOTHERAPY

The preoperative physiotherapy consultation in Satakunnan Keskussairaala is normally performed by the same physiotherapist every time. If the "normal" physiotherapist is not present another one will be assigned to do the consultation. The consultation is normally one to three weeks prior to the operation but it might vary due to staff issues and work load. When the patient arrives at the hospital he or she is taken to one of the examination rooms located next to the ward where the patients spend their recovery period post operation. Here is the patient interviewed, assessed and provided with information regarding the imminent operation and the recovery process post operation. Information about each patient is recorded in the form "polviproteesipotilaan preoperatiivinen tutkimuskaavake" (appendix 6). An average physiotherapy consultation lasts between 25 to 35 minutes. Other professionals from the multidisciplinary team that are also met at the preoperative visit include the head nurse and a radiographic nurse (if new x-rays need to be taken - only on demand from the surgeon).

9.1 Satakunnan Keskussairaala's protocol for preoperative total knee replacement

The ICF model has been used as a baseline tool to analyse and describe the pre operative physiotherapy process and protocol used at Satakunnan Keskussairaala. The pre operative protocol for Satakunnan Keskussairaala is portrayed in table 5.

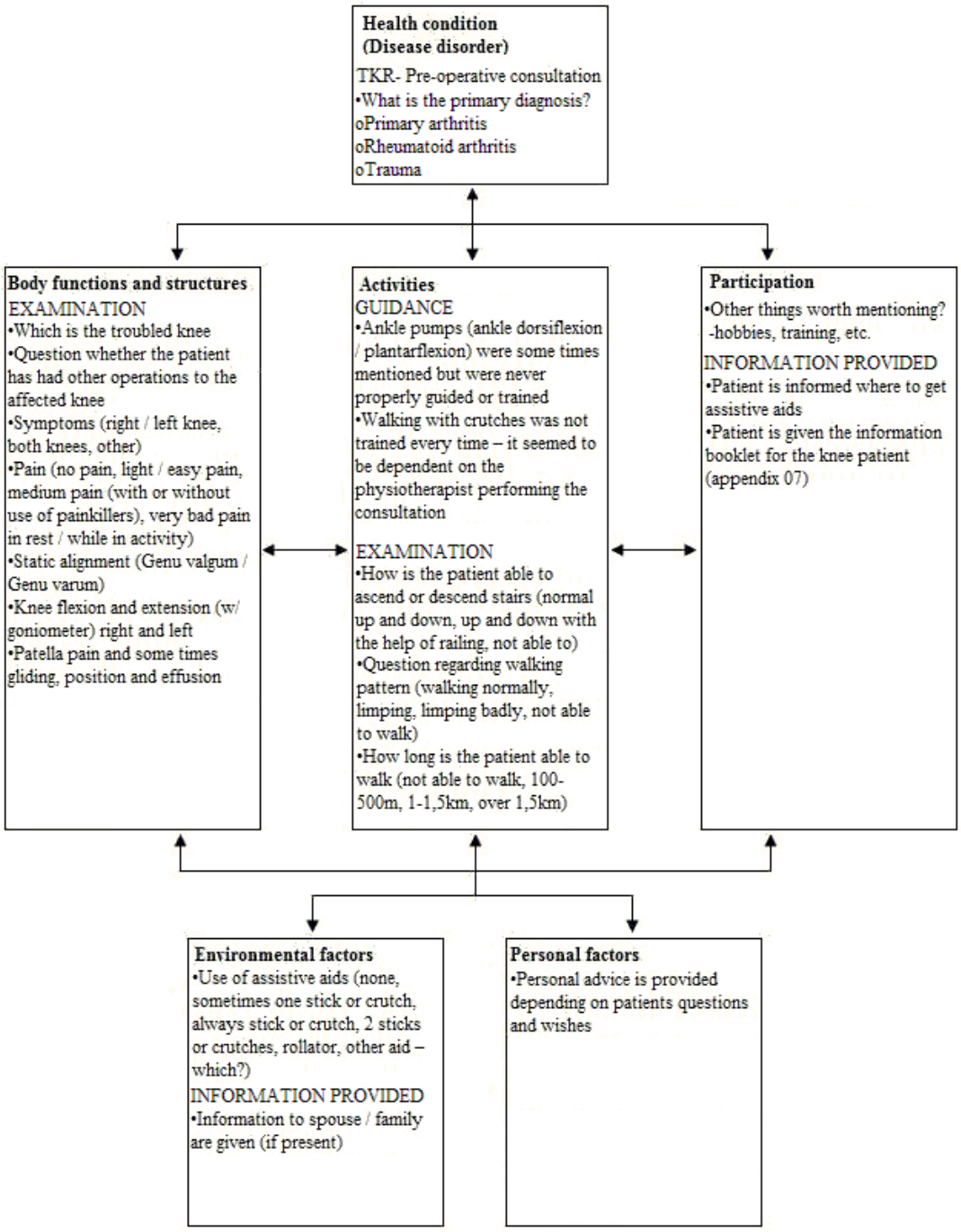


Table 5: Pre operative protocol used at Satakunnan Keskussairaala (Adapted from WHO 2002)

9.2 Evidence based research

According to three independent studies (Ackermann and Bennell 2004 (case study looking into different preoperative physiotherapy programs run at Australian hospitals); Lucas 2004 (mini-review looking into the effectiveness of a pre-operative exercise program (15-18 sessions) in improving mobility and function); Rodgers et al. 1998 (controlled trial looking into a 6 weeks physiotherapist lead preoperative program with focus on range of motion, walking speed and muscle strength post surgery)) there is not much evidence to support any form of pre-operative exercise program. All three studies failed to provide sufficient evidence to support an intervention before the total knee replacement.

A Cochrane review by McDonald et al. (2003) has looked into a different aspect of the pre-operative education. It states that there is good evidence to support the notions that pre-operative education doesn't seem to help improve levels of pain or function. Nor does it seem to decrease the amount of days spent at the hospital after surgery. It does however state that pre-operative education may decrease pre-operative anxiety. According to the same Cochrane review people who do not move well or are in need of information may benefit from education and information in such a way that the recovery is improved if the information and education is specially tailored for them (McDonald et al., 2003).

According to a randomized controlled trial by Thomas (2003) the pre-operative visit should include a teaching session by a physiotherapist. The session in itself should include instruction in use of assistive aids, collection of ROM data by the use of a universal goniometer, information about the exercises that should be performed before and after the operation and general information about the acute phase at the hospital post operation. Hence the pre-operative protocol used at the hospital is supported by Thomas's research.

The importance of determining the pre-operative ROM is also discussed in Kolisek et al.'s controlled trial from 2000, Lindgard et al.'s prospective observational study from 2004 and Ritter et al.'s controlled trial from 2003. They look at the importance good or bad pre-operative ROM might have on the outcome after a total knee replacement operation. They state that having good pre-operative ROM most likely will result in a good post-operative ROM and vice versa.

10 RESULTS – POSTOPERATIVE PHYSIOTHERAPY

Satakunnan Keskussairaala's post-operative physiotherapy in the acute phase does today consist of therapy given on day one post operation until discharge (normally day five). After the operation the patient is moved from the operating theatre to the recovery room and then on to the ward. The therapy given by the therapist during the hospital phase are varied and may range from actively helping the patient from getting up from bed into standing position to just being supportive and encouraging. All people are different and it is therefore important that the physiotherapist is able to adapt his / her skills to each patient and each situation.

10.1 Satakunnan Keskussairaala's protocol for postoperative total knee replacement

The ICF model has been used as a baseline tool to analyse and describe the pre operative physiotherapeutic process and protocol used at Satakunnan Keskussairaala. In the three following tables (table 6, table 7 and table 8) are the post operative protocol used at Satakunnan Keskussairaala portrayed. The protocol has been adapted in such a way that it is portrayed from the observer's point of view.

10.1.1 Postoperative physiotherapy day one

At about 7:45am the physiotherapist arrives at the hospital for the normal doctors round. At this round the therapist acquires needed information about all the patients at the ward and he or she is as well able to discuss and exchange views on the patient's current and upcoming situation with the multidisciplinary team. The physiotherapist normally sees the patient only once on day one and that is after lunch. After the visit the physiotherapist writes down what has been done and the current situation in the patient journal. The information is written with a green pen.

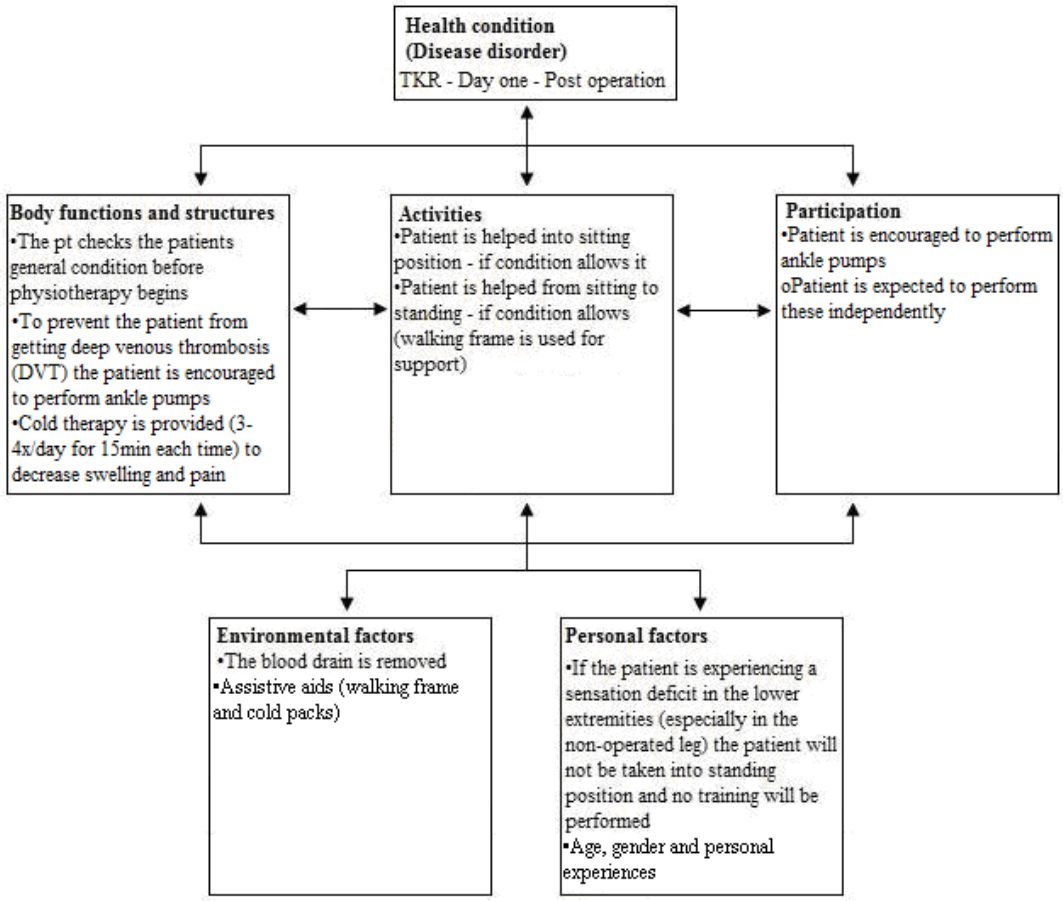


Table 6: Protocol for total knee replacement in Satakunnan Keskussairaala - day one post operation (Adapted from WHO 2002)

10.1.2 Postoperative physiotherapy day two

At about 7:45am the physiotherapist arrives at the hospital for the doctors round as normal. After the doctors round the physiotherapist tries to see the different patients at least twice on day two and that is before and after lunch. After the visit the physiotherapist writes down what has been done and the current situation in the patient journal. The information is written with a green pen.

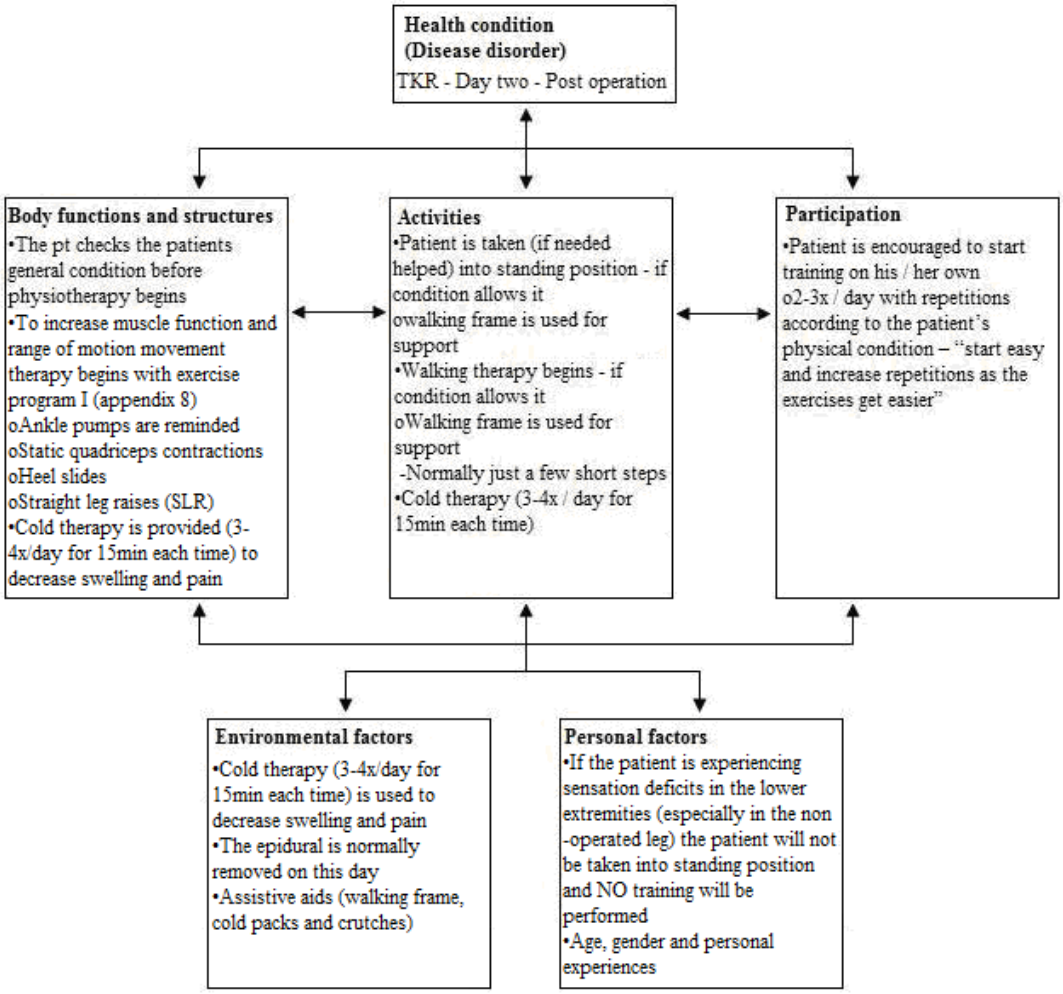


Table 7: Protocol for total knee replacement in Satakunnan Keskussairaala - day two post operation (Adapted from WHO 2002)

10.1.3 Postoperative physiotherapy day three to five

The physiotherapist follows the doctors round at about 7:45am as normal. The therapist tries to see the patient at least twice on day three to five and that is before and after lunch. On the day of discharge it might be three or more times dependent on the patient situation and the patient's wishes After the visit the physiotherapist writes down what has been done and the current situation in the patient journal. Documentation to own records as well as to new institution is made by the physiotherapist before discharge. The therapist also arranges continuation of therapy.

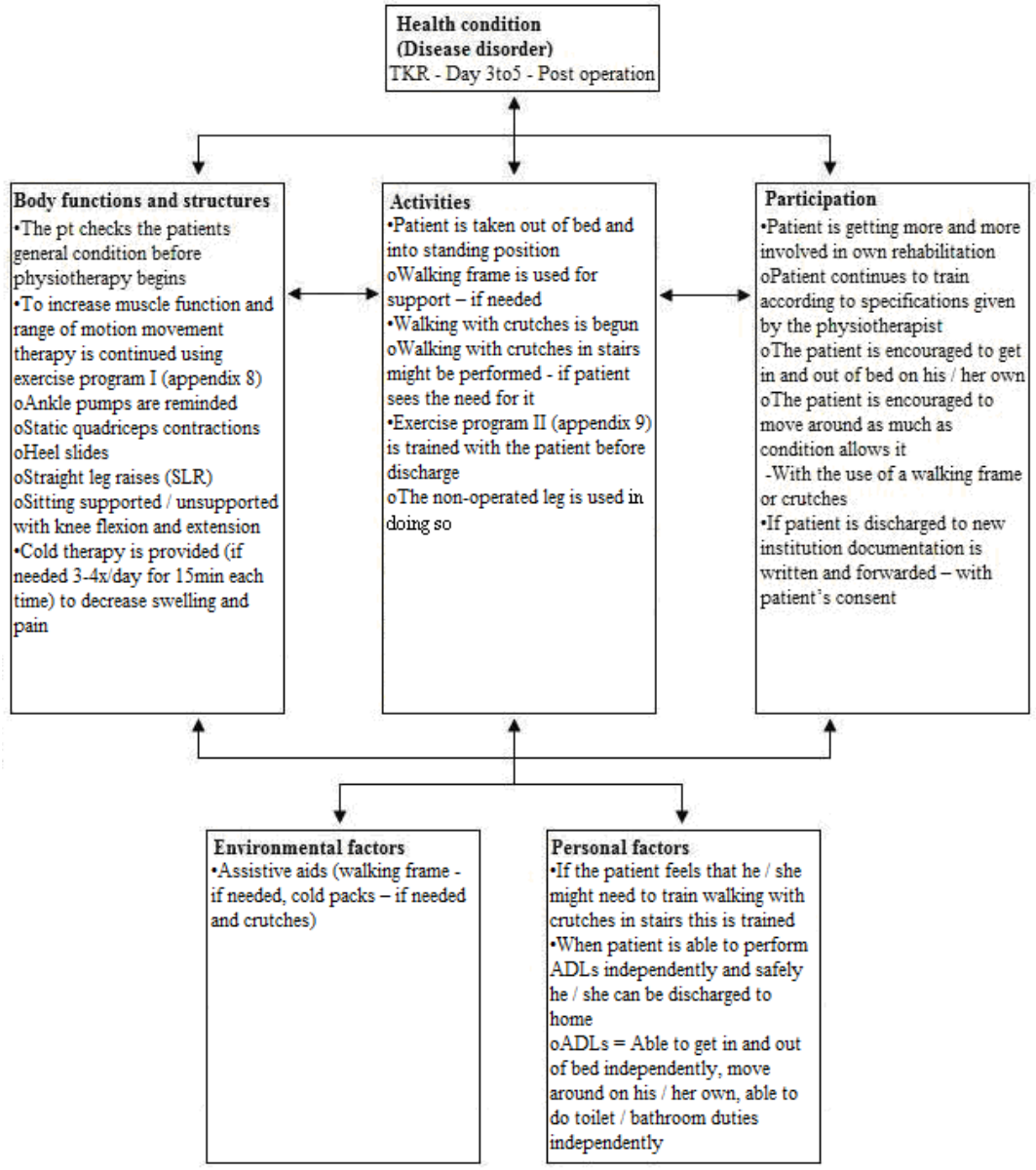


Table 8: Protocol for total knee replacement in Satakunnan Keskussairaala - day three to five post operation (Adapted from WHO 2002)

10.2 Multidisciplinary work at the hospital

There is a lot of multidisciplinary work throughout the hospital period. Most common is the morning meeting where the physiotherapist follows the doctors round. This happens every day at around 7.45am. At this round the physiotherapist follows the round that the doctor (-s) makes to each patient in the acute ward. In addition to the physiotherapist and the doctor (-s) there are also a nurse (normally the head nurse of the ward) present. Things such as the patients current situation, surgical procedure, medications, limitations, progression of therapy, when the patient will / should be discharged and to where are discussed at this multidisciplinary meeting. The doctor (-s) are the "leading authority" in this meeting but there are room for discussion and suggestions from all the medical professionals.

Another part of the multidisciplinary work is the writing that all professionals do in the patient protocol. The physiotherapist writes all that he or she does with the patient, how the patient performs the exercises, what the patient is allowed to or able to, when the patient received ice, et cetera. The physiotherapist writes all information with a green pen to distinguish what is done by the therapist from what is being done by for example the nurse or social worker. Different professionals have different coloured pens that they write with and all professionals add text in this protocol according to what they do with the patient. This type of protocol writing makes it easier for other professionals to see what has been done, what limitations this special patient has, what the patient can do or cannot do and hence all professionals help to give the patient the best and safest care possible.

10.3 Anaesthesia

According to the anaesthesiologist interviewed all patients receive regional anaesthesia before the operation. If the patient starts moving a lot or if there is unexplained pain the patient will be given a general anaesthesia as well. Depending on the type of anaesthesia, the following medication regime and the patient's response to the medication the post-operative physiotherapy treatment may be contraindicated or made difficult. Even though there are not recorded many

complications with post-operative physiotherapy due to anaesthesia the most common things that the physiotherapist might experience are patient: nausea, vomiting, confusion, dizziness and itching all over (appendix 12).

In some cases the patients might experience loss of sensation in the lower extremities. The reason for this loss of sensation can vary from patient to patient. In the cases where there are loss of sensation (especially if it occurs in the non-operated leg) there are not given any treatment by the therapist before the sensation in the lower extremities are recovered (appendix 12).

All patients receive epidural analgesia for the first two to three days post operation. After that the epidural is removed and the patient can be given normal painkillers, NSAIDs and opioids to reduce high-intensity pain and to improve compliance to therapy (appendix 12).

10.4 Evidence based research

Post operative physiotherapy for total knee replacement should include several factors such as exercises performed in bed as well as exercises performed while out of bed. The exercises would in many cases start immediately after the operation. Some orthopaedic surgeons want the patient to start the movement therapy as early as in the recovery room others would want the patient to wait until day one post surgery (Brugioni and Falkel, 2004; Isaac et al. 2005; Rasul and Wright 2005).

The hospital does today start with ankle pumps on post-operative day one. Isaac et al. (2005) propose in their controlled trial to start with the exercises as early as on the day of operation. Not all exercises are included on this day but they want to start with encouraging straight leg raises and knee extension as well as ankle pumps. They also propose that the patient should get out of bed into standing with a frame under the supervision of a physiotherapist on this day.

Isaac et al. (2005) does on day one post operation suggest a continuation of the ROM exercises. They would at this point also include further quadriceps and hamstrings

exercises as well as continue walking with a frame. On day two they continued the training and introduced walking with crutches. On day three they would discharge the patient if the patient were able to walk safely and independently with crutches (both on a flat surface and in stairs). This is somewhat similar to the hospitals procedure. The most significant difference is that they introduce the exercises used one day earlier than the hospital. The main discharge rate is also somewhat earlier. The average discharge rate for Isaac et al's study (2005) using this clinical pathway was at a mean 3,6 days (S.D. 1,0).

Rasul and Wright (2005) advocates starting with an exercise program resembling that used of the hospital at day one. They propose to start training bed mobility and transfers at this stage. At day two they would start active and active-assisted exercises for range of motion as well as training terminal knee extension. They would also start strengthening and ambulatory training with assistive aids as well as continuation and advance in functional training. The only difference here is the use of active-assisted ROM and the terminal knee extension. Day three to five is the same as the hospital's program except from the fact that they would start stretching of hamstrings and quadriceps at day five (Rasul and Wright, 2005).

According to Pearse et al.'s controlled trial from 2007 it is important to start mobilization in an early stage of the rehabilitation. They defined early mobilization as starting ambulatory training within 24 hours post surgery. The main reason for starting walking so early is the benefits it gives in reducing the risk of deep venous thrombosis post surgery. This supports the hospitals policy of starting walking therapy at day two post-operation.

The main thing about a protocol for rehabilitation should be to decrease or control pain, increase ROM to the maximum, increase walking length as well as to make the ambulation in itself better, improve muscle strength and provide the patient with tools for emotional support (Ranawat et al. 2003).

Several study reports have talked about length of stay and how to decrease it (Hewitt and Shakespeare 2001; Isaac et al. 2004; Kim et al. 2003). The main findings in these studies are that introducing a clinical pathway might reduce the stay with several

days. Reducing the average days the patients spend at the hospital will decrease the costs cumulated by each patient and hence save the hospitals costs. (Kim et al. 2003)

According to Ranawat et al. (2003) almost all patients that undergo a total knee replacement will end up with an improved ROM and an increased knee function regardless of what treatment regimen they undergo. The main thing is however that they meet with all the different instances of the multidisciplinary team. This team does according to Ranawat include the anaesthesiologist, physical therapist, social worker and rehabilitation meetings that occur at a frequent interval.

11 CONCLUSION

There is currently no evidence to support a physiotherapy led six to eight week training regime when it comes to enhancing range of motion, walking speed and muscle strength. Pre-operative education does not seem to help improve levels of pain or function either. Nor does it help on decreasing the days spent at the hospital post surgery. It does however seem to help decrease the level of pre-operative anxiety felt by the patient and it is suggested that people that doesn't move well or are in need of information may benefit from education and information in such a way that the recovery is improved if the information and education is specially tailored for them.

There is good evidence that supports early mobilization of patients immediately after the operation. There is however no clear consensus on what is meant by early mobilization in term of when to start the rehabilitation. Some studies suggest that starting the mobilization as early as in the recovery room might be beneficial for early recovery. There is also a general agreement that it is important to start training both in bed and out of bed as early as possible. Several studies support the notion that there is a need for a clear and concise clinical pathway describing the physiotherapy process in the acute hospital phase. The benefit of such a pathway might be a shorter hospital stay and hence a decrease in the amount of money cumulated by each patient.

12 DISCUSSION

There are a large number of studies performed in the field of pre-operative and post-operative physiotherapy for total knee replacement patients. Many of these studies talk about topics such as: what type of pre-operative exercise regimen should be used, when should the surgery be performed to achieve the best results, what type of exercises should be performed, how to increase muscle mass or range of motion post total knee replacement, stretching, et cetera. Similar for most studies found on these topics is that there is no general consensus on the outcomes. Many of the studies did also lack information on what types of exercises were performed, the number of repetitions instructed and how the exercises were performed.

As mentioned earlier in this thesis Finland has a much higher incidence number when it comes to performing total knee replacement surgery. The incidence is almost twice as high compared to its neighbouring countries: Sweden and Norway. The reason for the almost double number of incidences is unclear and need more research.

No article has been found that supports all the tests that the hospital performs but several articles support one or more of these tests. There is however no evidence based article found that states that other tests should be performed. A deeper or more extensive literature search with different search criteria might find better research than presented in this thesis on this specific topic. Further studies in what tests should be performed and why they are performed might find strengths or weaknesses in the specific rehabilitation protocol used. Some tests might prove to be useful while other might not have the needed, wanted or believed benefit for recovery.

When a patient experiences nausea, vomiting, confusion, dizziness and itching all over the treatment should be focused on the abilities of the patient to comply with the appropriate treatment. Vomiting, nausea, dizziness and itching are not according to the observer considered contraindications by the hospital for treatment but it might limit performance capacity of the patient and the things the physiotherapist can do. An example where this is happening might be a patient that are experiencing nausea,

vomiting and itching. This patient can still perform exercises in bed but might not be suited to perform longer standing / walking training due to safety reasons. The patients own ability to focus on the task at hand might also be limited and that is a consideration that the physiotherapist needs to assess.

The research pathway described by Isaac et al. (2005) challenges the post operative procedure that the hospital is using at this moment. Some of the aspects from this study could be included in a "new" clinical pathway for the hospital. The main reason for a possible review of the current pathway is the possible decrease of hospital expenses due to fewer days spent in the hospital by each patient. There are according to Isaac et al. (2005) no diverse effects to their early mobilization regime. This would therefore be a good topic to look into for further studies.

It has been mentioned that other students might continue the cooperation between Satakunnan Keskussairaala and Satakunta University of Applied Sciences on the topic of total knee replacement. If this is the case a natural point of continuation might be to study what happens after the knee patient leaves the hospital, what is the best treatment protocol for the time after the hospital and what could be done to done to update this protocol if it proves to be needed. Providing the hospital with a new and updated clinical pathway for physiotherapy might prove to be beneficial as well.

When writing this thesis a rumour arose that the hospital has a pre pre-operative consultation. What happens on this visit and what kind of training or information, et cetera is given here is something that other students might care to look into in a later study. There were questions in the end that the researcher did not manage to find answers to. One of the reasons for this might be the limited skill the researcher has in Finnish language. It might also be that the intended sharing of information between the researcher from this study and the students performing a similar study on hip replacement did not go as well as intended. The researcher feels that his limitations in the native language might have been a disadvantage to this study. A better understanding of the native language might have helped give answers to the question if there actually are a pre pre-operative visit and what happens in this visit as well as to other non specified questions.

A second limitation to this study is the fact that the researcher did not have extensive theoretical knowledge about the topic before the study was conducted. The pre-operative checklist and hence also the post-operative checklist was mainly founded on previous experience from clinical practice periods as well as some basic literature research. A more thorough literature research before the study might have proven to be beneficial to this study and to the way the study were performed. If there had been deeper knowledge beforehand the researcher might have chosen to perform the study as a participant observer instead of as a complete observer. The reason for this is that in retrospect this seems to be a more authentic way to collect this type of data. The fact that the three researchers chose to be present as a complete observer could have changed the way both the patient and the physiotherapist observed behaved and therefore it might have influenced the reliability in some way. Being three observers are also a big strength of this bachelor thesis. Since we were three independent researchers observing the same situations independently we were able to get nonbiased data from each session. After each session we sat down and discussed and reviewed each observation and hence we were able to see things that the other ones might have missed as well as strengthen the belief in what we had actually seen. This clearly increases the reliability of the data collected.

A third limitation in this study is the way the research materials were analyzed. Using such a simplified method might have caused the researcher to miss important aspects of the physiotherapy treatment. It might also have caused the validity of this thesis to be somewhat decreased. A more thorough analysis of the material might have provided the researcher with a stronger base for founding the protocol. Despite the limitations in the analyzing process the researcher feels that he has been able to record and provide an in depth description of the process used at the hospital today.

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LIST OF APPENDICES

TUTKIMUSSUUNNITELMA

1. OPINNÄYTETYÖN TAUSTA JA TARKOITUS

Valitsimme aiheeksemme kartoittaa lonkka- ja polviproteesipotilaiden fysioterapian toteutumista sairaalavaiheessa sekä ennen että jälkeen leikkauksen. Proteesipotilaiden kuntoutus kiinnostaa meitä ja Satakunnan keskussairaala on halukas yhteistyöhön proteesipotilaiden fysioterapia -palveluketjun kehittämiseksi.

Kartoituksen teoriaosuus kerätään proteesileikkauksiin ja kuntoutukseen liittyvästä kirjallisuudesta sekä aiemmista tutkimuksista. Lonkka- ja polviproteesipotilaiden kuntoutuksen vaikuttavuudesta tehdään suhteellisen paljon tutkimuksia vuosittain. Haluamme omassa tutkimuksessamme kartoittaa lonkka- ja polviproteesipotilaiden fysioterapian hoitokäytäntöjä Satakunnan keskussairaalassa, ja verrata näitä kyseisiä käytäntöjä uusimpaan tutkimustietoon.

2. OPINNÄYTETYÖSSÄ KÄYTETTÄVÄT KESKEISET KÄSITTEET

Keskeisiä käsitteitä työssämme ovat lonkka- ja polviproteesipotilaat sekä uusimpaan tutkimustietoon perustuva fysioterapia.

3. OPINNÄYTETYÖN TAVOITTEET JA TUTKIMUSKYSYMYKSET

Opinnäytetyön tavoitteena on dokumentoida tämänhetkiset hoitokäytännöt fysioterapiassa ja tarvittaessa tuottaa uudet tai parannetut potilasohjeet lonkka- ja polviproteesipotilaille.

Tutkimuskysymykset

Mitä uusin tutkimustieto kertoo lonkka- ja polviproteesipotilaiden
a preoperatiivisesta fysioterapiasta?
b postoperatiivisesta fysioterapiasta?

Miten pre- ja postoperatiivinen fysioterapia toteutuu Satakunnan keskussairaalassa?

4. TUTKIMUKSEN TOTEUTTAMINEN

Tutkimus tulee olemaan ensisijaisesti laadullinen kuvaileva tutkimus. Tutkimusmenetelmänä on fysioterapian hoitokäytäntöjen toteutumisen observointi/seuranta osastolla N2B. Tarkoituksenamme on tehdä kolme käyntiä (21.-23.3.2007) osastolle N2B, joiden aikana suoritamme pilottitutkimuksen. Pilottitutkimuksen aikana observoimme kolme pre- ja postoperatiivista polviproteesipotilasta sekä kolme pre- ja postoperatiivista lonkkaproteesipotilasta. Varsinainen fysioterapian hoitokäytäntöjen kartoitus tapahtuu 28.-30.3.2007. Kartoituksen aikana observoimme kaksi pre- ja postoperatiivista polviproteesipotilasta sekä kaksi pre- ja postoperatiivista lonkkaproteesipotilasta. Pilottitutkimuksesta saamistamme tuloksista riippuen seurattavien potilaiden määrä saattaa muuttua varsinaisessa tutkimuksessa.

5. OPINNÄYTETYÖN AIKATAULU

Aikataulu liitteenä

Päivi Hirvonen
Vebjörn R. Punsvik
Maija Tuomisto

APPENDIX 2

Maija Tuomisto
Kalliokatu 26 a 6
26100 Rauma
puh. 050-5553603

Päivi Hirvonen
Vebjörn R. Punsvik

Satakunnan keskussairaala
Ylihoitaja Kirsti Siikarla

ANOMUS
19.2.2007

TUTKIMUSLUPA-ANOMUS

Teemme opinnäytetöinämme Satakunnan keskussairaalassa toteutuvan lonkka- ja polviproteesipotilaiden fysioterapian kuvausta. Kuvailevat tutkimukset liittyvät laajempaan hankkeeseen, jossa on tarkoitus kehittää lonkka- ja polviproteesipotilaiden fysioterapian palveluketjua niin sairaalavaiheessa kuin ennen ja jälkeen leikkauksen.

Pyydämme lupaa saada suorittaa hankkeen ensimmäisen vaiheen kuvaileva tutkimus seuraamalla lonkka- ja polviproteesipotilaiden fysioterapian toteutumista Satakunnan keskussairaalassa osastolla N2B. Työssämme havainnoimme systemaattisesti fysioterapeutin työtä kyseisten potilaiden kanssa, selvitämme käytössä olevaa potilaan ohjausmateriaalia ja perehdymme teoreettisesti olemassa olevaan fysioterapian vaikuttavuustutkimukseen tältä alueelta.

Opinnäytetöidemme (2kpl) tarkoituksena on dokumentoida tämänhetkinen fysioterapiaprotokolla ja tarvittaessa tuottaa uudet tai parannetut potilasohjeet lonkka- ja polviproteesipotilaille. Tarkoituksenamme on, että hankkeen ensimmäisestä vaiheesta

tehdään kaksi opinnäytetyötä: toinen keskittyy lonkkaproteesipotilaan fysioterapiaan ja toinen polviproteesipotilaan fysioterapiaan.

Tutkimukseen osallistuvilta potilailta pyydetään kirjallinen suostumus allekirjoittaneiden läsnäoloon hoitotilanteessa. Fysioterapiakäytäntöä kartoittavassa tutkimuksessa emme tule haastattelemaan potilaita emmekä käyttämään tietoja heistä. Tarkoituksenamme on suorittaa pilottitutkimus 21.-23.3.2007, jonka pohjalta viimeistelemme varsinaisen tutkimuskaavakkeen (checklist-liite).

Opinnäytetöidemme ohjaajana toimii SAMK:sta yliopettaja TtT Anne Kärki ja Viveka Höijer-Brear

Terveisin,

Maija Tuomisto
Päivi Hirvonen
Vebjörn R. Punsvik

RE: Question regarding possible use of copyprotected material
From: Infoperson (zimmer.infoperson@zimmer.com)
Sent: Friday, September 14, 2007 2:22:38 PM
To: 'vebjoern riibe punsvik' ([redacted]@hotmail.com)

Dear Vebjörn Riibe Punsvik,

In response to your e-mail dated Tuesday, September 11, 2007, Zimmer is please to grant you the limited right to display the requested image in your paper. Zimmer cannot accept responsibility for the content of your paper.

We do ask that you state on your paper, "Images © Zimmer, Inc. Used by permission only."
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Best regards,
Vicki Johnson
Interactive Communications Coordinator
Zimmer, Inc
574-371-8521
vicki.johnson@zimmer.com
www.zimmer.com

From: vebjoern riibe punsvik [mailto:[redacted]@hotmail.com]
Sent: Tuesday, September 11, 2007 8:41 AM
To: zimmer.infoperson@zimmer.com
Cc: [redacted]@hotmail.com
Subject: Question regarding possible use of copyprotected material

Good afternoon

My name is Vebjörn Riibe Punsvik and I am a fourth year student from Satakunta University of Applied Sciences, Pori / Finland. I am currently studying to become a physical therapist and I am at present time writing my bachelor thesis (final work) for this education level. The reason why I contact you is to ask permission to use the prosthesis picture / figure from your web site in my final work.

Link to site: http://www.zimmer.com/z/ctl/op/global/action/1/id/8138/template/PC/navid/88

The picture / figure will be referenced according to the Harvard System of Referencing.

I would be grateful if you could respond to my request as soon as possible since my bachelor thesis is in the last stage of writing.

With Regards
Vebjörn Riibe Punsvik

Vebjørn Riibe Punsvik
Student
tel. +358 [redacted]
e-mail:
vebjoern_punsvik@hotmail.com

APPENDIX 4

Calculation of incidence of primary TKR in Sweden in 2005.

According to The Swedish Knee Arthroplasty Register (2006) there were 8,736 implants for primary total knee replacement in Sweden in 2005.

In December 2005 the numbers of inhabitants in Sweden were 9,047,752 (Statistiska Centralbyrån, 2007).

To calculate the incidence of primary total knee replacement per 100,000 inhabitants in 2005 we need to use this calculation:

8,736 / 9,047,752 = 0,000965543706326168091256259013288 6
This is the incidence per 1 inhabitant

0,000965543706326168091256259013288 6 * 100,000 =
96,554370632616809125625901328 86
This is the incidence per 100,000 inhabitants. Since it is impossible to have an incidence of 96,5 persons the final calculation is:

97 persons per 100,000 inhabitants

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[Cited 20 April 2007]

APPENDIX 5

Calculation of incidence of primary TKR in Finland in 2004.

According to Finnish Arthroplasty Register (2006) there were 6,873 implants for primary total knee replacement in Finland in 2004.

31.12.2004 the numbers of inhabitants in Finland were 5,237,000 (Statistics Finland, 2007).

To calculate the incidence of primary total knee replacement per 100,000 inhabitants in 2004 we need to use this calculation:

6,873 / 5,237,000 = 0.00131239259117815543249952262745 85
This is the incidence per 1 inhabitant

0.00131239259 * 100,000 = 131,23925911781554324995226274585
This is the incidence per 100,000 inhabitants. Since it is impossible to have an incidence of 132 persons the final calculation is:

132 persons per 100,000 inhabitants

References

Finnish Arthroplasty Register. 2006. *The 2004 Implant Yearbook on Orthopaedic Endoprosthesis.* [online]. Publications of the National Agency for Medicines.
Available from:
http://www.laakelaitos.fi/uploads/julkaisut/laitteet_ja_tarvikkeet/Yearbook_2004.pdf
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sairaanhoitopiiri
Fysiatria ja kuntoutus

Polviproteesipotilaan preoperatiivinen tutkimuskaavake

Potilaan nimi ja syntymäaika _____

Tutkimuspäivä ja fysioterapeutti _____

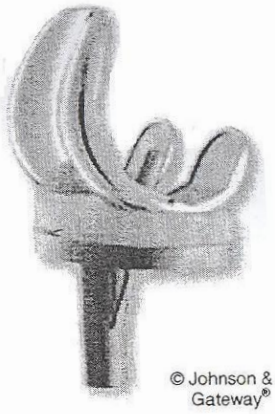
Leikattava polvi ☐ oikea ☐ vasen Diagnoosi ☐ primaari artroosi ☐ reuma ☐ trauma	Portaat ☐ normaalisti ylös ja alas ☐ ylös ja alas kaiteeseen tukien ☐ ei pääse
Aiemmat operaatiot polveen ☐ ei operaatiota ☐ operaatio, mikä_____	Seisten / selinmakuulla ☐ varus ☐ valgus
Oireilu ☐vain oikea polvi oireilee ☐ vain vasen polvi oireilee ☐ molemmat polvet oireilevat ☐ muut syyt rajoittavat liikkumista	Polvien liikkeet oikea vasen fleksio ____ ____ ekstensio ____ ____
Kipu ☐ kivuton ☐ lievä ☐ kohtalainen (usein särkylääkettä) ☐ kova (lepokipu tai kova liikekipu)	Patellakipu _____ Atrofia _____
Kävely ☐ normaali ☐ ontuu lievästi (ei haittaa liikkumista) ☐ ontuu pahasti ☐ ei kävele Kävelymatka ☐ yli 1,5 km ☐ 1-1,5 km ☐ 100-500 m ☐ sisätiloissa Apuvälineet ☐ ei apuvälineitä ☐ ajoittain keppi tai sauva ☐ aina keppi tai sauva ☐ 2 keppiä tai sauvaa ☐ kävelyteline ☐ muu, mikä_____	Muuta huomioitavaa _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

12/04/em

Kumppanuudella terveyttä

POLVEN TEKONIVELLEIKKAUS

- potilasohje -



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SISÄLLYS

1. TEKONIVELLEIKKAUKSEEN TULIJALLE

Tämän oppaan tarkoituksena on antaa tietoa polven tekonivelleikkauksesta ja siihen liittyvistä asioista. Lisäksi se auttaa valmistautumaan itse leikkaukseen sekä leikkauksesta kuntoutumiseen.

Tutustukaa huolellisesti tähän oppaaseen ja toimikaa annettujen ohjeiden mukaan. Mahdolliset yksilölliset ohjeet saatte leikanneelta ortopediltä leikkauksen jälkeen.

2. NIVELRIKKO

Polven nivelrikko kehittyy usein tuntemattomasta syystä. Sen syntymistä voivat edistää esimerkiksi ylipaino, polven vammat sekä nivelsairaudet. Nivelrikko lisääntyy iän myötä ja on yleinen sairaus yli 50-vuotiailla. Se kehittyy hitaasti, yleensä kuluu monta vuotta siihen, että tarvitaan toimenpiteitä.

Polven nivelrikon yleisin oire on kipu. Alkuvaiheessa kipu tuntuu liikkeelle lähtiessä. Myöhemmin kipua esiintyy rasituksessa ja rasituksen jälkeen. Nivelrikon edetessä polvi särkee levossakin. Kipu paikallistuu yleensä polven ja säären alueelle säteillen kohti nilkkaa. Toinen merkittävä oire kipujen lisäksi on polven jäykkyys ja liikkeiden rajoittuminen. Nivelrikossa polveen voi tulla myös virheasentoja.

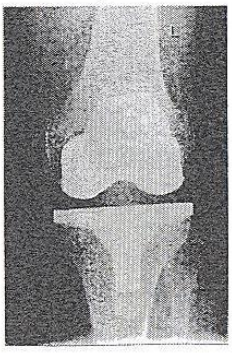
Polven nivelrikon oireita voidaan lievittää lääkkeillä ja fysioterapialla sekä käyttämällä liikkumisen apuvälineitä, esimerkiksi kyynärsauvoja. Laihduttaminen helpottaa oireita useimpien potilaiden kohdalla selvästi.

3. TEKONIVELLEIKKAUS

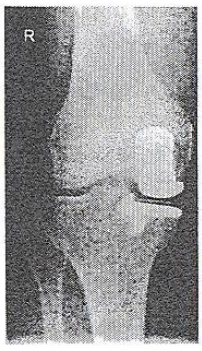
Polven tekonivelleikkaus on ajankohtainen, jos oma nivel on kulunut eivätkä muut hoidot enää auta. Leikkauksen tavoitteena on kipujen poistaminen, virheasentojen korjaaminen sekä toimintakyvyn parantaminen.

Kuluneet nivelpinnat korvataan tekonivelellä, joka kiinnitetään luusementillä. Reisiluun puolelle laitetaan metallinen nivelpinta ja sääriluun puolelle osa, jossa nivelpinta on muovia ja pohjaosa metallia. Myös polvilumpion takaosa voidaan korvata muovisella nivelpinnalla. Nivelrikko voi vaurioittaa myös vain osaa polvinivelestä, jolloin hoidoksi valitaan polven puolitekonivel. Ortopedi valitsee käytettävän tekonivelmallin aina yksilöllisesti.

Polven tekonivelleikkaus tehdään selkäydinpuudutuksessa, mutta halutessaan toimenpiteen ajaksi voi saada myös kevyen nukutuksen. Leikkauksessa nivel vaihdetaan polven etuosaan tehdyn pitkittäisen viillon kautta ja leikkaus kestää 1½-2 tuntia. Suomessa tehdään vuosittain noin 9000 polven tekonivelleikkausta ja 600 uusintaleikkausta.



Polven tekonivel



Polven puolitekonivel

4. VALMISTAUTUMINEN LEIKKAUKSEEN

Ennen leikkausta tulette tutkimus- ja ohjauskäynnille ortopedian osastolle N2B. Toimikaa kutsukirjeessä saamienne ohjeiden mukaisesti.

Ottakaa osastopoliklinikkakäynnille mukaan:
- Täytetty esitietolomake ja MRSA-lomake
- Käyttämienne lääkkeiden reseptit
- Tämä opas

Ennen leikkausta teidän tulee hankkia apuvälineitä, jotka saatte lainaksi maksutta kotipaikkakuntanne terveyskeskuksesta. Apuvälineiden käyttöaika on 1-3 kuukautta.

Tarvittavat apuvälineet:
- Kyynärsauvat tai muu kävelyn apuväline

Muut mahdollisesti tarvittavat apuvälineet:
- WC-koroke
- Suihkujakkara
- Sukanvetolaite

Teidän on hyvä miettiä kotona selviytymistänne leikkauksen jälkeen jo ‘loin, kun odotatte leikkaukseen pääsyä. Keskustelkaa läheistenne kanssa esimerkiksi ruuanlaiton, kaupassakäynnin ja siivouksen järjestelyistä.

Hyvä yleiskunto sekä polviniveltä tukevien ja liikuttavien lihasten hyvä kunto nopeuttaa leikkauksesta toipumista. Tässä oppaassa olevan harjoitusohjelman tekemisen voitte aloittaa jo ennen leikkausta.

5. TOIMINTA OSASTOLLA ENNEN LEIKKAUSTA

Leikkausta edeltävä päivä:

Saavutte osastolle leikkausta edeltävänä päivänä. Tällöin hoitaja ottaa teidät vastaan ja esittelee osaston. Teillä on myös mahdollisuus tavata lääkäri.

Ottakaa sairaalaan mukaan:

- Kyynärsauvat tai muu sovittu kävelyn apuväline
- Henkilökohtaiset hygieniavälineet
- Tämä opas

Arvoesineet ja suuremmat rahasummat on hyvä jättää kotiin.

Leikkausta edeltävänä päivänä saatte vielä syödä ja juoda normaalisti. Ravinnotta tulee olla kello 24 jälkeen.

Leikkauspäivä:

Leikkauspäivän aamuna hoitaja ohjaa teidät suihkuun. Lisäksi teille laitetaan aamulla myös virtsakatetri.

6. TOIMINTA OSASTOLLA LEIKKAUKSEN JÄLKEEN

Kivunhoito:

Leikkausalueella esiintyy usein kipua, jota hoidetaan säännöllisellä kipulääkityksellä. Kipulääkitystä saatte aluksi lääkeannostelijan avulla ja myöhemmin pistoksina tai suun kautta tabletteina. Kertokaa rohkeasti kivuistanne, sillä riittävä kipulääkitys nopeuttaa toipumistanne.

Haavaimu ja virtsakatetri:

Haavaimu poistetaan 1-2 päivän kuluttua leikkauksesta vuodon määrästä riippuen. Virtsakatetri poistetaan toisena leikkauksen jälkeisenä päivänä.

Pahoinvointi ja suolen toiminta:

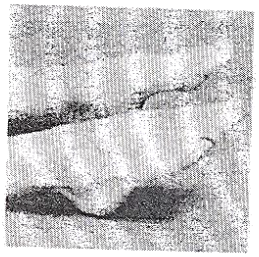
Ensimmäisinä päivinä leikkauksen jälkeen saattaa esiintyä pahoinvointia, joka voi johtua esimerkiksi lääkkeistä. Suolen toiminta saattaa olla aluksi lamaannuksissa. Sitä helpottavat liikkeellelähtö, monipuolinen ravinto, riittävä juominen ja tarvittaessa lievät ulostuslääkkeet.

Laskimotukoksien ehkäisy:

Leikkauksen jälkeen kasvaa riski saada alaraajoihin laskimotukoksia. Ennaltaehkäisynä käytetään pistoksena annettavaa verenohennuslääkettä ("napapiikki"), tukisukkia sekä verenkiertoa aktivoivia harjoituksia.

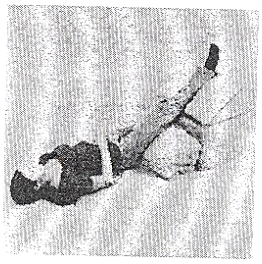
Asento- ja kylmähoito:

Leikkauksen jälkeen voitte olla vuoteessa haluamassanne asennossa, kylkimakuulla on hyvä pitää tyynyä polvien välissä. Istuessa leikatun jalan tulee olla tukevasti lattialla. Leikatun alaraajan voi tukea leikkauksen jälkeen tyynyillä kohoasentoon turvotuksen helpottamiseksi. Tyynyn laittaminen pelkästään polvitaipeen alle on kiellettyä, jotta polvi suoristuu kunnolla. Myös kylmähoitoa voidaan käyttää turvotuksen ja kivun helpottamiseksi.

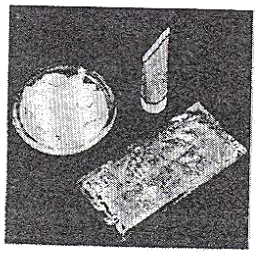


Selinmakuulla. Koukista ja ojenna nilkkoja reippaaseen tahtiin.

Tee liike hereillä ollessasi joka tunti, 20-30 peräkkäin.



Selinmakuulla. Tue jalka suorana kohoasentoon kuvan osoittamalla tavalla.



Kylmää voi käyttää kahden tunnin välein 15 minuuttia kerrallaan. Muista laittaa pyyhe ihon ja kylmäpakkauksen väliin.

HUOM! Kylmägeelin käyttämisen voi aloittaa vasta sitten, kun leikkaushaava on kunnolla parantunut.

Liikkuminen:

Leikatulle jalalle saa yleensä astua kivun sallimissa rajoissa. Hoitohenkilökunta auttaa teidät liikkeelle ensimmäisenä päivänä leikkauksen jälkeen vointinne ja ortopedin antaman luvan mukaan. Polven liikkuvuuden ja reisilihasten harjoittaminen aloitetaan samana päivänä. Harjoitusohjelma löytyy tämän oppaan sivuilta 14-15. Tarvittaessa voidaan käyttää polven passiivista koukistajalaitetta muun harjoittelun lisäksi. Ennen kotiutumista teille ohjataan myös turvallinen liikkuminen kyynärsauvojen kanssa tasamaalla ja portaissa.

7. KOTIUTUMISEN JÄLKEEN

Sairaalassaoloaikanne on noin 5-7 vuorokautta. Kotiinpääsyn edellytyksenä on, että liikutte omatoimisesti ja selviydytte päivittäisistä toiminnoista itsenäisesti. Tarvittaessa teille järjestetään jatkohoitopaikka.

Haavanhoito ja laskimotukoksien ehkäisy:

Teidän tulee noudattaa teille annettuja haavanhoito-ohjeita. Haavan sulkevat hakaset poistetaan 14 vuorokauden kuluttua leikkauksesta. Suihkussa voitte käydä, kun haava on suojattu oikein. Saunaan voitte mennä hakasten poiston jälkeen omat rajoituksenne huomioiden. Laskimotukoksien ehkäisynä käytettävä pistoshoito jatkuu kotona vielä noin kolmen viikon ajan. Teidät opetetaan huolehtimaan pistoshoidosta itse.

Tulehdusten hoito:

Tulehdusten ennaltaehkäisy ja huolellinen hoito ovat tärkeitä leikkauksen jälkeen, koska tekoniveleen voi tulla tulehdus muualta elimistöstä. Teidän tulee hoitaa huolellisesti kaikki bakteeritulehdukset. Mikäli teille suunnitellaan hammas-, tähystys- tai muita toimenpiteitä tulee teidän aina kertoa hoitavalle lääkärille, että polvessanne on tekonivel.

Liikunta ennen ortopedin jälkitarkastusta:

Ortopedin jälkitarkastukseen asti suosittelemme liikunnaksi kävelyä sisällä tai ulkona sekä tässä oppaassa olevan harjoitusohjelman noudattamista. Kyynärsauvoja tai muuta kävelyn apuvälinettä tarvitsette noin 4 viikon ajan leikkauksen jälkeen.

Liikunta ortopedin jälkitarkastuksen jälkeen:

Jatkossa sopivia liikuntamuotoja ovat esimerkiksi vesiliikunta, kävely, pyöräily ja hiihto. Sellaiset liikuntamuodot, joissa alaraajaan tulee iskumaista rasitusta (esimerkiksi juoksu ja pallopelit), voivat aiheuttaa tekonivelen ennenaikaista kulumista ja irtoamista. Samasta syystä raskaita nostoja tai pitkäaikaista työskentelyä kyykkyasennossa ei suositella. Myöskään polvilleen menoa ei suositella.

Painonhallinta:

Painonhallinta on erittäin tärkeää tekonivelen kestävyyden kannalta. Runsas ylipaino lyhentää tekonivelen käyttöikää ja ennenaikaistaa sen irtoamista.

Autoilu:

Autolla voitte matkustaa normaalisti heti yleistilan ja polven liikkuvuuden sen salliessa. Itse voitte ajaa autoa vasta ortopedin jälkitarkastuksen jälkeen.

Sukupuolielämä:

Tekonivelleikkaus ei vaikuta seksuaalielämään. Alkuvaiheessa on kuitenkin varottava, ettei haava-alue joudu alttiiksi hankaukselle.

Metallinilmaisimet:

Metallinilmaisimet saattavat reagoida tekoniveleen. Siksi on mahdollisuus saada todistus, että teillä tekonivel. Todistuksen saatte halutessanne ortopedin jälkitarkastuksen yhteydessä.

LOPULLINEN LEIKKAUSTULOS ON ARVIOITAVISSA VASTA NOIN VUODEN KULUTTUA LEIKKAUKSESTA. OMA AKTIIVINEN OTE TOIPUMISEEN JA KUNTOUTUMISEEN ON TÄRKEÄÄ HYVÄN LOPPUTULOKSEN SAAVUTTAMISEKSI.

8. SEURANTA

Jälkitarkastus on kirurgian poliklinikalla noin 6-8 viikon kuluttua leikkauksesta. Tällöin leikannut ortopedi tutkii teidät ja käynnillä arvioidaan myös jatkofysioterapian tarve.

Toinen kontrollikäynti on vuoden kuluttua leikkauksesta fysiatrian poliklinikalla fysioterapeutin luona. Tällöin otetaan myös röntgenkuva, jonka ortopedi arvioi.

Seuraavien kontrollikäyntien tarve arvioidaan yksilöllisesti.

9. YHDISTYSTOIMINTA

Suomen Nivelyhdistys ry toimii reuma-, nivelrikko- ja tekonivelpotilaiden edunvalvontajärjestönä. Lisäksi yhdistys järjestää neuvontaa ja tukihenkilötoimintaa. (http://www.niveltieto.net)

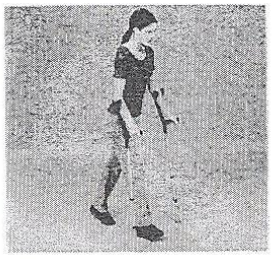
Porin nivelpiiri

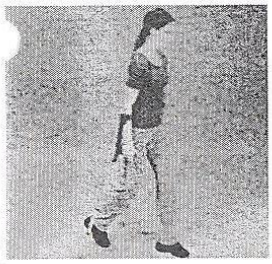
Eija Tiainen
p. 045 - 1318 810
sähköposti:
eija.tiainen@niveltieto.net

Rauman seudun nivelpiiri

Tuula Räikkönen
p. 045 - 1318 816
sähköposti:
tuula.raikkonen@niveltieto.net

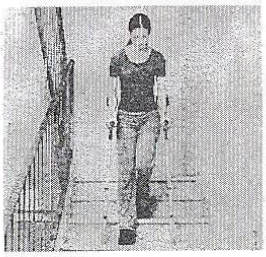
10. KYYNÄRSAUVAKÄVELY





Sauvakävely tasamaalla:

1. Aseta sauvat eteen.
2. Siirrä leikattu jalka sauvojen väliin.
3. Astu terveellä jalalla eteenpäin.



Portaiden kulkeminen alaspäin:

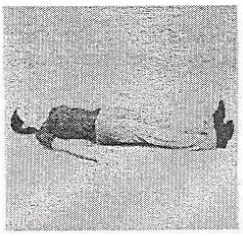
1. Siirrä sauvat alas seuraavalle portaalle.
2. Siirrä leikattu jalka sauvojen kanssa samalle portaalle.
3. Astu terveellä jalalla leikatun jalan viereen.

Portaiden nouseminen ylöspäin:

1. Ota terveellä jalalla askel ylös seuraavalle portaalle.
2. Siirrä sauvat samalle portaalle terveen jalan kanssa.
3. Siirrä leikattu jalka terveen jalan viereen.

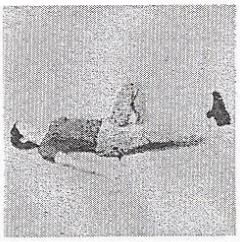
11. HARJOITUSOHJELMA

Harjoitusohjelman tarkoituksena on palauttaa polvinivelen liikkuvuus ja alaraajan lihasten voima leikkauksen jälkeen. Ohjelma tehdään 2-3 kertaa joka päivä. Liikkeet tehdään rauhallisesti välillä rentoutuen. Mikään harjoitus ei saa tuottaa voimakasta kipua tai lisätä turvotusta voimakkaasti.



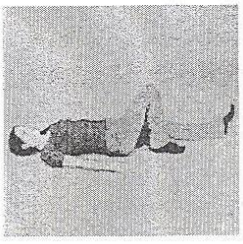
Selinmakuulla. Vedä nilkat koukkuun ja paina samanaikaisesti polvet tiukasti alustaa vasten. Pidä jännitys 5 sekuntia ja rentoudu.

Toista liike niin monta kertaa kuin jaksat, pidä tauko ja toista.



Selinmakuulla. Terve jalka koukussa, jalkapohja alustalla. Koukista leikatun jalan nilkka ja ojenna polvi. Nosta jalka 20 cm ylös ja laske jalka hitaasti alustalle. Rentoudu liikkeiden välillä.

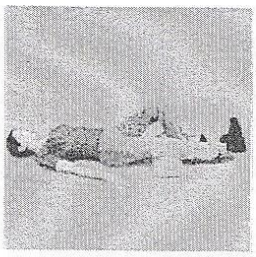
Toista liike niin monta kertaa kuin jaksat, pidä tauko ja toista.



Selinmakuulla. Koukista ja ojenna leikattua polvea liu'uttamalla jalkapohjaa alustaa pitkin.

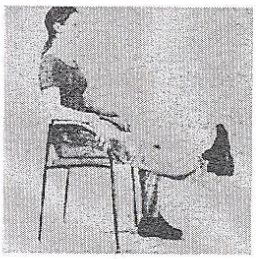
Toista liike 15-20 kertaa.

Aloita seuraavat harjoitukset muutaman päivän kuluttua leikkauksesta.
Viikon 2!



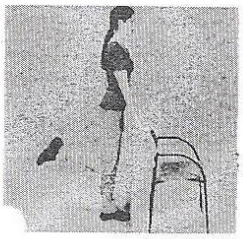
Selinmakuulla. Terve jalka koukussa, jalkapohja alustalla. Laita leikatun reiden alle tyyny. Vedä nilkka koukkuun, jännitä reisilihas ja ojenna polvi suoraksi. Pidä jännitys 5 sekuntia ja laske jalka rauhallisesti alas.

Toista liike niin monta kertaa kuin jaksat, pidä tauko ja toista.



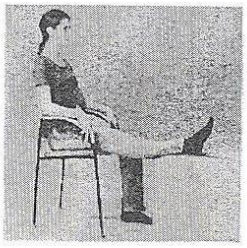
Istuen. Vedä leikatun jalan nilkka koukkuun ja ojenna polvi suoraksi. Pidä jännitys 5 sekuntia. Koukista tämän jälkeen polvea mahdollisimman paljon tuolin alle liu'uttaen jalkapohjaa lattiaa pitkin.

Toista liike 15-20 kertaa.



Seisten. Ota tukea tuolista. Koukista leikattu jalka, kantapää kohti pakaraa. Laske jalka suoraksi toisen viereen.

Toista liike 15-20 kertaa.



Istuen. Tue jalka kuvan mukaisesti niin, että polvitaive on tyhjän päällä.

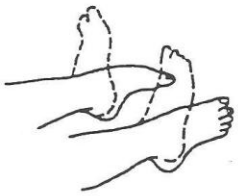
Pidä venytys 30 sekuntia. Toista 3-5 kertaa.

2007

POLVIPROTEESIPOTILAAN HARJOITUSOHJELMA I

keskussairaala
Fysiatrian toimenpideyksikkö
p.

NOUDATTAMALLA SEURAAVIA OHJEITA PIENENNÄT RISKIÄ SAADA LASKIMOVERITUKOKSIA JA EDISTÄT LEIKKAUKSESTA KUNTOUTUMISTA.
TEE HARJOITUSOHJELMA 2-3 KERTAA VUOROKAUDESSA .



Selinmakuulla, koukista ja suorista nilkkoja tehokkaasti.

Toista hereillä ollessasi joka tunti, 20-30 liikettä peräkkäin.

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Selinmakuulla, vedä nilkat koukkuun ja paina samanaikaisesti polvitaipeet tiukasti alustaa vasten. Pidä jännitys muutama sekunti ja rentoudu.

Toista liike niin monta kertaa kuin jaksat, pidä tauko ja toista sarja.

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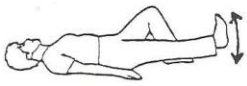
Selinmakuulla, koukista terve jalka, jalkapohja alustalle.



Koukista leikatun jalan nilkka ja ojenna polvi, nosta jalka noin 20 cm ylös alustalta ja laske jalka hitaasti alustalle. Rentoudu.

Toista liike niin monta kertaa kuin jaksat, pidä tauko ja toista sarja.

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Selinmakuulla, koukista leikattua polvea enintään 90 asteeseen (ensimmäisen viikon aikana) hitaasti liu´uttamalla jalkapohjaa alustalla ja ojenna suoraksi.

Toista liike 15-20 kertaa peräkkäin.

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POLVIPROTESIPOTILAAN HARJOITUSOHJELMA II

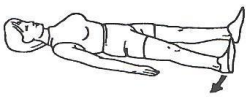
keskussairaala
Fysiatrian toimenpideyksikkö
, p.

6 / 2003 / TL-M

NOUDATTAMALLA SEURAAVIA OHJEITA EDISTÄT LEIKKAUKSESTA KUNTOUTUMISTA, OHJELMAA TULEE JATKAA 2-3 KUUKAUDEN AJAN. TEE HARJOITUSOHJELMA 2-3 KERTAA VUOROKAUDESSA.

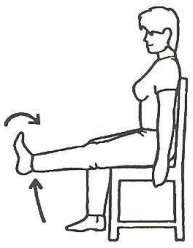
Selinmakuulla, terve jalka koukussa, jalkapohja alustalla. Laita leikatun jalan reiden alle tyyny. Vedä nilkka koukkuun, jännitä reisilihas ja ojenna leikattu polvi suoraksi. Pidä jännitys muutama sekunti, laske jalka rauhallisesti alustalle, rentoudu.

Toista liike niin monta kertaa kuin jaksat, pidä tauko ja toista.



Selinmakuulla vie leikattu jalka suoraan sivulle ja tuo takaisin toisen viereen. Voit nostaa jalkaa siirron aikana hieman irti alustalta.

Toista liike niin monta kertaa kuin jaksat, pidä tauko ja toista.



Istuen, vedä leikatun jalan nilkka koukkuun ja ojenna polvi suoraksi. Pidä jännitys muutama sekunti ja laske jalka hitaasti alas jalkapohja alustalle. Vedä polvea lattiaa pitkin niin koukkuun kuin mahdollista ja ojenna polvi suoraksi eteen.

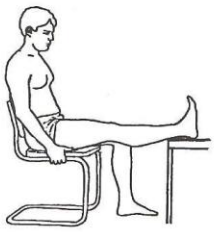
Toista liike 15-20 kertaa peräkkäin.

Seisten, ota tukea esimerkiksi tuolista ja koukista leikattua jalkaa polvesta taakse-ylös niin pitkälle kuin mahdollista ja laske jalka suoraksi toisen viereen.

Toista liike 15-20 kertaa peräkkäin.

Seisten, ota tukea esimerkiksi tuolista, pidä paino mahdollisimman tasaisesti molemmilla jaloilla ja nouse varpaille ylös, laske itsesi alas.

Toista liike niin monta kertaa kuin jaksat, tauko ja toista.



Jos polvesi ei ojennu aivan suoraksi, voit venyttää polven kudoksia ja jänteitä seuraavissa asennoissa:

1. Istu tuolilla leikattu jalka tuettuna kuvan mukaisesti. Anna polven ojentua rauhallisesti tässä asennossa. Pidä venytys mahdolllisimman pitkään. Toista 3-5 kertaa.

2. Selinmakuulla, aseta pyyherulla leikatun jalan kantapään alle ja anna polven painua suoraksi. Pidä venytys mahdollisimman pitkään. Toista 3-5 kertaa.

Knee protocol as of today

From: **vebjoern riibe punsvik** ([redacted]@hotmail.com)
Sent: Tuesday, April 17, 2007 2:22:00 PM
To: terhi.lahti@satshp.fi
Cc: viveka.hoijer-brear@samk.fi; [redacted]@hotmail.com

Dear Terhi

This is as far as I have been able to understand your knee protocol as of today. If you have any comments or any immediate reactions please do not hesitate to comment.

Best regards
-Vebjörn R. Punsvik-

Knee protocol as of today w/ attachments ;-)

From: **vebjoern riibe punsvik** ([redacted]@hotmail.com)
Sent: Tuesday, April 17, 2007 2:36:10 PM
To: terhi.lahti@satshp.fi
Cc: viveka.hoijer-brear@samk.fi; [redacted]@hotmail.com
Protocol.doc (29.5 KB), Service p...doc (36.2 KB)

I was a little too fast.

Here is the protocol as well as the service process schematics...

-Vebj.-

Vast:Knee protocol as of today w/ attachments ;-)

From: **Lahti Terhi** (terhi.lahti@satshp.fi)
Sent: Thursday, April 26, 2007 1:52:53 PM
To: vebjoern riibe punsvik ([redacted]@hotmail.com)

Hello!

These seem to be alright but they take away in I day after operation blood-dreeni? not epidural. Epidural is taken off in the II day after operation.

Hope you understand what i mean.

Terhi

Questions and answers to / by the head physiotherapist

1. What happens if the patient doesn't have any sensation / feeling in the lower extremities post surgery?
    a. Is there a general guideline?
    b. Who makes the decision?

The general guideline is that no physiotherapy will be given to patients suffering from sensation deficits to the lower limbs. This is especially true to those patients that have sensation loss in the non-operated leg.

This is an understanding that we have with the doctors and we as physiotherapists are able to make that call independently.

2. What are the criteria / protocol for discharge?

When the patient is discharged we write a report on the current situation on a light green paper. This paper always follows the patient's files wherever he or she goes after concluded therapy at the hospital.

If there are things that are "difficult" to write in the report we might make a phone call to the new rehabilitation place, etc. Here we can give a more detailed oral report on the current situation and of possible problems concerning this specific patient.

The patient will normally be discharged to home, rehabilitation centre, city hospital or to a home care program depending on the living situation and on the ability to take care of normal activities of daily living.

After 6 - 8 weeks the patient will come back to the hospital to see the surgeon for a check-up.

there are no general guidelines written down concerning discharge. It is a discussion between the multi-disciplinary team

3. When does the physiotherapist introduce exercise program number II and when does the patient start it?

The physiotherapist will introduce the patient to exercise program number II before discharge. The therapist will then run through the exercises on the non-operated leg. The patient will normally start using the program after 1 week but if there are any kinds of problems he / she might not start until after 2 weeks post operation

4. How does the doctors round work?

The doctors round starts at 07:45 in “module I” and at 08:00 in “module II”. Module I and II describes the dividing of the ward into two equal and independent sections (authors comment).

The round might take from 30min to 1,5hours depending on the situation of the in-patients at any given time.

Those who are included in the round are: 1-5 doctors, module physiotherapist and one of the module nurses.

On the round the multidisciplinary team will discuss:

- The current situation
- What is to be done next or what shall not be done
- Limitations
- Medication
- Progression of therapy
- When to remove drains / epidural / catheter / etc (mainly doctors responsibility)
- When the patient will be discharged and to where

The doctors will give basic directions but the team will discuss how things will progress and the physiotherapist always explain what has been done and what the plans are for the continuation.

5. When are the preoperative consultation conducted in relationship to the operation?

The pre-operative visit is normally 1-3 weeks prior to the operation. This is however only used as a guideline. It has been patients coming in for a pre-operative consultation less than a week or more than thee weeks prior to the operation. The main reasons for the differences in time are staff issues and general work load.

Questions and answers to / by the anaesthesiologist

Please describe the normal routine of anaesthesia used at this hospital.

The patient can normally choose between spinal anaesthesia and epidural anaesthesia. Spinal anaesthesia is the most commonly used anaesthesia for people undergoing total knee replacement. At the same time when the operative anaesthesia is given the (urinary) catheter is placed.

During operation a regional anaesthesia is used. If the patient experience pain or if movement occur the patient will be given general anaesthesia. The main rule is to give as little as needed.

When the patient comes out of the operation room and is situated in the recovery room he or she is asked about how the pain is. The Visual Analogue Scale (VAS) is used to determine the level of pain. The VAS should be less than 4. It is more common for patients undergoing total knee replacement to have higher pain score compared to total hip replacement.

If the epidural is functioning well there are normally no need for additional opiates, Panadol or Non-Steroidal Anti-Inflammatory Drugs (NSAIDs).

There are performed about 800 surgeries each year in Pori and Rauma together.

How is the relationship between TKR and THR?
The relationship between total hip and knee replacement surgery is about 50/50

How long are the epidural normally attached?
The epidural is normally attached 2-3 days post-op. If the patient only receives epidural anaesthesia there is most often no nausea or dizziness.

After the epidural is removed the patients receive normal painkillers and NSAIDs according to the need of each patient.

What kind of complications or problems are there with the anaesthesia that the patients receive?
There are in general very few complications with the surgeries performed. The most common complication post surgery is maybe infection.

If local anaesthesia the patient may experience nausea, vomiting, itching all over, confusion and dizziness.

Does the patient see the anaesthesiologist at the preoperative visit?
The patient doesn't see the anaesthesiologist before the operation in a pre-operative setting.

Arvoisa potilas

Olemme kolme fysioterapiaopiskelijaa Satakunnan ammattikorkeakoulusta. Opintoihimme kuuluu opinnäytetyön tekeminen. Valitsimme aiheeksemme kartoittaa lonkka- ja polviproteesipotilaiden fysioterapian toteutumista sairaalavaiheessa sekä ennen että jälkeen leikkauksen Satakunnan keskussairaalassa. Opinnäytetöidemme tavoitteena on dokumentoida tämänhetkiset hoitokäytännöt fysioterapiassa ja tarvittaessa tuottaa uudet tai parannetut potilasohjeet lonkka- ja polviproteesipotilaille.

Pyydämme Sinua ystävällisesti olemaan mukana tutkimuksessamme. Tarkoituksenamme on seurata hoitotilannetta sekä dokumentoida kirjallisesti huomiomme fysioterapian toteutumisesta. Osallistumme hoitotilanteeseen ainoastaan tarkkailijoina. Kaikki seurantatapahtumat tapahtuvat ehdottoman luottamuksellisesti. Emme tule käyttämään tietoja potilaista opinnäytetyössämme.

Kiittäen

Porissa 19.3.2007

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APPENDIX 14

SUOSTUMUS HOITOTILANTEEN SEURANTAAN

Olen tietoinen siitä, että osallistumiseni tutkimukseen on vapaaehtoista ja että henkilöllisyyteni ei paljastu missään vaiheessa ulkopuolisille. Potilastietoja ei tulla käyttämään opinnäytetöissä. Halutessani voin myös keskeyttää hoitotilanteeni (fysioterapia) seurannan.

Paikka:_____ pvm:___.___.2007

_____.
Allekirjoitus ja nimenselvennys

_____.
Suostumuksen vastaanottaja

_____.
Allekirjoitus ja nimenselvennys

Checklist knee – Pilot study

Preoperative physiotherapy:
When is it performed in relation to the operation?

Information:

- About the procedure
- About the recovery
    - at the hospital (first few days)
    - after the hospital
- Medication
- Instruction book to the patient and its content
- To the spouse / family
- How / where to get assistive aids

Questions to the patient:

- Where / how does the patient live
- Focused medical history
    - onset of pain
    - location of pain
    - VAS
    - How is pain affecting functional ability
    - Physical activity (morning gymnastics, pool gymnastics, Nordic walking, etc)
    - Walking distance
- Other symptoms (other knee / hip, disabilities, participation problems, etc…)

Tests:

- Walking
- Static alignment (Genu valgum Λ / Genu varum Ω)
- Measurement of knee flexion (active and passive) w/ goniometer
- Measurement of knee extension (active and passive) w/ goniometer
- Leg length difference
- Anterior / posterior drawer test
- LCL / MCL test
- Patella gliding
- Patella position
- Effusion / fluids in the knee
- Atrophy of muscles (quadriceps, vastus medialis, etc)
- Muscle strength
- Nerve testing / sensation

Training:

- Walking with crutches
- Getting in and out of bed
- Exercises that should be trained before and will be trained after the operation
    - static quadriceps contraction / Quadriceps sets
    - ankle pumps
    - heel slides / bed supported knee bends
    - knee straightening exercise (with small roll / towel underneath heal – press down)
    - static hold exercise (roll underneath the knee – straighten knee – hold)
    - sitting supported / unsupported knee bends
    - passive knee stretching (pillow / box underneath heel – let knee straighten/fall down)
    - straight leg raise (SLR)

Postoperative physiotherapy

At the day of the operation the patient should be reminded about breathing exercises and thrombo-prophylaxis.

Day one - post operation:

- The PT familiarizes him / herself with the surgery report
- The PT familiarizes him / herself with the staff's report of current situation
- Checks the patient's condition before starting physiotherapy
- Breathing exercises
- Thrombo-prophylaxis
- Gets the patient up into standing (if condition allows it)
    - Standing exercise(-s) with standing / walking frame
- Cold therapy
- Positioning therapy

- In the afternoon: standing exercises
    - If possible - walking exercises with standing / walking frame or crutches
- Movement therapy / training is started (see: exercises given at preoperative visit)
- Gets the patient up into sitting position while eating if condition allows it
- Documentation

Day two - post operation:

- With the help of walking frame the patient is helped to the shower
- Movement therapy continues
    - Exercises
    - CPM machine
- Cold therapy
- Walking with crutches is begun
- Patient is allowed up and walking according to his / her condition
- If needed the patient is given support while walking
- Documentation

Day three to five - post operation:

- Get the patient more involved in own rehabilitation.
    - Walking with crutches, independent training, ADL
- Measurement of the ROM of the knee joint
- Walking with crutches in stairs
- Documentation
- Information leaflet about continuing therapy etc given to patient before discharge
- Written report about current situation
- Arrange continuation of therapy at health care centre or private clinic?

Assistive aids:

- Crutches
- Grabber
- Sock slider

Checklist knee – Main studies

Postoperative physiotherapy
At the day of the operation the patient should be reminded about breathing exercises and thrombo-prophylaxis.

Day one - post operation:

- The PT familiarizes him / herself with the surgery report
- The PT familiarizes him / herself with the staff's report of current situation
- Checks the patient's condition before starting physiotherapy
- Breathing exercises
- Inspection / palpation
- Ankle pumps (thrombo-prophylaxis)
- Gets the patient up into standing (if condition allows it)
    - Standing / walking exercise(-s) with standing / walking frame
- Cold therapy
- Positioning therapy

- In the afternoon: standing exercises
    - If possible - walking exercises with standing / walking frame or crutches
- Movement therapy / training is started
- Gets the patient up into sitting position while eating if condition allows it
- Documentation

Training:

- ankle pumps
- static quadriceps contraction (Quadriceps sets)
- heel slides (bed supported knee bends)
- straight leg raise (SLR)
- Walking with crutches
- Getting in and out of bed

Day two - post operation:

- With the help of walking frame the patient is helped to the shower
- Movement therapy continues
    - Exercises (see training)
    - CPM machine (if needed – recommended by doctor)
- Cold therapy
- Walking with crutches is begun
- Patient is allowed up and walking according to his / her condition
- If needed the patient is given support while walking
- Documentation

Training:

- ankle pumps
- static quadriceps contraction (Quadriceps sets)
- straight leg raise (SLR)
- heel slides (bed supported knee bends)
- Walking with crutches (flat surface and in stairs)
- Getting in and out of bed

Day three to five - post operation:

- Continuous training with physiotherapist
- Get the patient more involved in own rehabilitation.
    - Walking with crutches
    - Independent training
    - ADL
- Measurement of the ROM of the knee joint
- Walking with crutches in stairs
- Documentation
- Information leaflet about continuing therapy etc given to patient before discharge
- Written report about current situation
- Arrange continuation of therapy at health care centre or private clinic

Training:

- Ankle pumps
- Static quadriceps contraction (Quadriceps sets)
- Straight leg raise (SLR)
- Heel slides (bed supported knee bends)
- Walking with crutches (flat surface)
- Walking with crutches (in stairs)
- Static hold exercise (roll underneath the knee – straighten knee – hold)
- Sitting supported / unsupported with knee extension and flexion
- Passive knee stretching (pillow / box underneath heel – let knee straighten / fall down)

Assistive aids:

- Crutches

Protocol - Preoperative physiotherapy:

- It is normally the same physiotherapist that conducts the consultation each time
- Normally performed 1 – 3 weeks before the operation
- Patient (p) sees the head nurse and new x-rays are taken if the surgeon requests it
- Filling of form for the knee replacement patient (Polviproteesipotilaan preoperatiivinen tutkimuskaavake) (Appendix 3)
- General information about recovery and the hospital stay
- Personal advice depending on patients questions and wishes
- P is informed about where to get assistive aids
- P is given the information booklet for the knee patient (Polven tekonivelleikkaus - potilasohje)
- Information to spouse / family (if present and if wanted)
- Documentation of clinical findings

Tests performed by the physiotherapist

The hospital in question does not perform any kind of muscle testing in the pre-operative consultation. They do however test:

- Static alignment (Genu valgum X / Genu varum Ω)
- Knee flexion (w/ goniometer)
- Knee extension (w/ goniometer)
- Patella pain and sometimes gliding, position and effusion

Exercises

According to my observations walking with crutches are not trained every time. It is dependent on the patient and the physiotherapist in charge of the pre-operative consultation whether it is trained or not. Ankle pumps (ankle dorsiflexion / plantarflexion) were sometimes mentioned but were never properly guided or trained during any of my observations.

Information given

The hospital provides the patient with a written information leaflet about the procedure that he or she is about to go through as well as oral information about:

- The procedure
- The prosthesis
- The recovery
    - at the hospital and after the hospital
- How long the patient will be required to use crutches
- How / where to get assistive aids
- To the spouse / family (if present and if wanted)

Assistive aids

No assistive aids are provided by the hospital. The patient is however informed where to go to acquire the assistive aids needed before and after the operation.

Timing

According to a short interview conducted after the main studies the pre-operative consultation is normally be performed 1-3 weeks before the operation. This is however just a guideline to follow rather an absolute rule. This information was confirmed during the main studies. The three cases observed came in to pre-operative consultation 9 and 12 days before the surgery.

Protocol - Postoperative physiotherapy

Day one post-op.:

- The physiotherapist (pt) follows the doctors round (~07:45) and acquires needed information to begin physiotherapy
- The blood drain is removed
- The first visit by the pt is after lunch
- The pt checks the patients general condition before physiotherapy begins
- Ankle pumps are reminded and encouraged
- P is helped up into sitting position - if condition allows it
- P is helped from sitting to standing - if condition allows it (walking frame used for support)
    - If the p is experiencing a sensation deficit in the lower extremities especially in the non-operated leg the patient will not be taken up into standing and no training will be performed
- Cold therapy (3-4x / day for 15min each time)
- Documentation in p journal (written by green pen)
    - what has been done and what is the situation right now

Day two post-op.:

- The pt follows the doctors round (~07:45) and acquires needed information to continue physiotherapy
- The epidural is normally removed
- The pt checks the patients general condition before physiotherapy begins
- Movement therapy begins (exercise program I)
    - P is instructed to do exercises on his / her own 2 - 3x / day with repetitions according to the patient's physical condition – "start easy and increase repetitions as the exercises gets easier".
- P is helped up into standing with the use of a walking frame
- Walking therapy begins - if condition allows it
    - walking frame is used for support

    - If the p is experiencing a sensation deficit in the lower extremities especially in the non-operated leg the patient will not be taken up into standing and no training will be performed
- Cold therapy (3-4x / day for 15min each time)
- The pt tries to see the p at least twice a day
- Documentation in p journal (written by green pen)
    - what has been done and what is the situation is right now

Day three to five post-op.:

- The pt follows the doctors round (~07:45) and acquires needed information to continue physiotherapy
- The pt checks the patients general condition before physiotherapy begins
- The p is getting more involved in own rehabilitation by exercising on his / her own and getting out of bed and moving around as much as condition allows it
- Walking with crutches is begun
- The p moves around according to his / her own condition using (walking frame or) crutches
- Exercise program I is continued
- Cold therapy (if needed 3 - 4x / day for 15min each time)
- **before discharge**
    - exercise program number II (Polviprotesipotilaan harjoitusohjelma II) is trained by using the non-operated leg
    - walking with crutches in stairs (if p feels like it or if he / she feels that they might need it)
    - when p is able to perform ADLs independently and safe the he / she can be discharged to home
        - ADLs = Able to get in and out of bed independently, move around on his / her own, able to do toilet / bathroom duties independently
    - pt arranges the continuation of physiotherapy
- Documentation to own records
- Documentation to new institution with patient's consent

Exercises

Day 1:

- ankle pumps (reminded and encouraged)
- sitting / standing (if the condition allows it)

Day 2:

- Exercise program I introduced (appendix 5)
    - ankle pumps (reminded)
    - static quadriceps contraction
    - heel slides
    - straight leg raise (SLR)
    - getting in and out of bed (assisted if needed)
    - standing and if condition allows it walking a few steps (with walking frame)

Day 3-5:

- Ankle pumps (reminded)
- Static quadriceps contraction
- Heel slides
- Straight leg raise (SLR)
- Walking with crutches (flat surface)
    - Walking with crutches (in stairs – before discharge)
- Sitting supported / unsupported with knee extension and flexion
- Before discharge:
    - exercise program number II (Polviprotesipotilaan harjoitusohjelma II) is trained by using the non-operated leg (appendix 6)
    - walking with crutches in stairs (if p feels like it or if he / she feels that they might need it)

<u>Assistive aids after surgery</u>

Crutches should be used until the patient comes to the post-operative inspection with the doctor at about 6 – 8 weeks after the surgery.