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# LIFE SITUATION IN PATIENTS AND THEIR FAMILY MEMBERS AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION – ASPECTS OF HEALTH AND SUPPORT IN DIFFERENT CARE SETTINGS

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# Life situation in patients and their family members after allogeneic hematopoietic stem cell transplantation – aspects of health and support in different care settings

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*“Inne i dig öppnar sig valv bakom valv oändligt.*
*Du blir aldrig färdig, och det är som det skall”*

Ur Romanska bågar av Tomas Tranströmer

# ABSTRACT

Allogeneic hematopoietic stem cell transplantation (HSCT) is mainly an intensive treatment option for hematology malignancies. During the past decades, improved care and treatment have been systematically developed. One example is the possibility for patients to choose to be at home rather than in the hospital during the early neutropenic phase after HSCT. Recent studies have shown positive medical advantages with home care. The overall aim of this thesis was to describe patients and family members' life situation after HSCT, as well their experiences from two different care setting: the patient's home or the hospital. Data from patient-reported experiences were used in studies **I** and **II** and patient reported- outcomes in study **III**. In study **IV** data from family members experiences were used. Data from 173 (study **I** *n*=41; study **II** *n*= 15; study **III** *n*= 117) patients and 14 family members (study **IV**) were included in the thesis. In study **I** patients in both the hospital care group and the home care group expressed high satisfaction with the care and support during the acute post-transplantation phase. In study **II** four categories were identified from the interviews with patients *To be in a safe place*, *To have a supportive network*, *My way of taking control*, and *My uncertain way back to normal*. In study **III**, a cross-sectional survey was conducted and the majority of patients in both hospital care (77%) and home care (78%) rated their general health as 'good'. A median of 14 symptoms were reported by patients in both hospital (0-36) and home care (1-29). There were no significant differences regarding general health, symptom occurrence or self-efficacy between patients in hospital and those in home care. In study **IV** interviews with family members generated a main category, *Being me and being us in an uncertain time* was identified and five generic categories *To receive the information I need, To meet a caring organization, To be in different care settings, To be a family member*, and *To have a caring relationship*. In summary, numerous factors (the care routines, information, the competence and support from the health care team) related to the care were shown to influence the feeling of being safe regardless of care setting. Both patients and family members express the uncertainty associated with the HSCT. Different strategies (to have faith, being positive, hope and live in the present) were used to balancing the uncertainty. The majority of patients in both hospital care and home care rated their general health as 'good'. A high symptom occurrence was reported in both groups in median five years post HSCT.



Keywords: allogeneic hematopoietic stem cell transplantation, family member, home care, hospital care, patient reported experiences, patient reported outcomes

# LIST OF SCIENTIFIC PAPERS

I. **Bergkvist K**, Larsen J, Johansson U-B, Mattsson J, Svahn B-M. Hospital care or home care after allogeneic hematopoietic stem cell transplantation – patients' experiences of care and support.
European Journal of Oncology Nursing 2013; 17(4):389-95.

II. **Bergkvist K**, Fossum B, Johansson U-B, Mattsson J, Larsen J. Patients' life situation during allogeneic hematopoietic stem cell transplantation – when care is given in different care settings.
Submitted manuscript.

III. **Bergkvist K**, Winterling J, Johansson E, Johansson U-B, Svahn B-M, Remberger M, Mattsson J, Larsen J. General health, symptom occurrence and self-efficacy in adult survivors after allogeneic hematopoietic stem cell transplantation: across-sectional comparison between hospital care and home care.
*Support Care Cancer* 2015; 23(5):1273-1283

IV. **Bergkvist K**, Larsen J, Johansson U-B, Mattsson J, Fossum B. Being me and being us in an uncertain time – Family members' experiences during allogeneic hematopoietic stem cell transplantation when care is given in the patient's home or in hospital.
Submitted manuscript.

# CONTENTS

# LIST OF ABBREVIATIONS

| | |
|---|---|
| aGVHD | Acute Graft-Versus-Host Disease |
| ALL | Acute Lymphatic Leukemia |
| AML | Acute Myeloid Leukemia |
| BM | Bone Marrow |
| BMT | Bone Marrow Transplantation |
| cGVHD | Chronic Graft-Versus-Host-Disease |
| CB | Cord Blood |
| CLL | Chronic Lymphatic Leukemia |
| CML | Chronic Myeloid Leukemia |
| EBMT | European Society of Blood and Marrow Transplantation |
| G-CSF | Granulocyte Colony Stimulating Factor |
| GVL | Graft-Versus-Leukemia |
| HLA | Human Leukocyte Antigen |
| HRQoL | Health- Related Quality of Life |
| HSCT | Allogeneic Hematopoietic Stem Cell Transplantation |
| MAC | Myeloablative Conditioning |
| MDS | Myelodysplastic Syndrome |
| PBSC | Peripheral Blood Stem Cell |
| PREM | Patient- Reported Experience Measures |
| PROM | Patient-Reported Outcomes Measures |
| QoL | Quality of Life |
| RIC | Reduced Intensity Conditioning |
| TBI | Total Body Irradiation |
| WHO | World Health Organization |

# 1 PREFACE

During many years working as a nurse in different hematology and oncology settings, I have met many persons who were diagnosed with a variety of cancers. Being treated for cancer often implies a long treatment period, including surgery, chemotherapy, radiation and sometimes hematopoietic stem cell transplantation (HSCT). As a nurse, you meet not only the patient but also their family members during this long period. The patient often waits for a positive outcome (i.e. to be cured), but for some patients this journey will be the end of their life. In these meetings with the patients I have seen different strategies to handle this uncertain life situation. During the trajectory, it is common for the patient to present a high complex symptom burden and an important focus in oncology nursing is to identify, prevent and manage these symptoms. Another focus is to help the patients integrate into a new life situation.

Before I started working as a lecturer in Nursing, I had an interest in advanced home care. Therefore, when I was given the possibility to analyze data from study I, regarding patients' experiences of care and support after HSCT, it was a natural starting point for this thesis. The other sub-studies (II-IV) were designed to focus on patients' and family members' different experiences and outcomes after HSCT, in relation to different care settings.

I have learned so much about the scientific process during my post-graduate studies, but the main impression and lesson is people's power and intrinsic strength to create a new life, especially when life is threatened. My hope is that this thesis contributes to an increased understanding of patients who undergo HSCT and their family members, and gives new insight and knowledge to those who cares for these patients and family members.

# 2 BACKGROUND

The focus of this thesis is on patients' and their family members' life situation after allogeneic hematopoietic stem cell transplantation (HSCT) - when care has been given in different care settings. This chapter begins with sections describing HSCT from different perspectives in order to provide an understanding of the patient's life situation after HSCT. The following sections focus on related concepts, patient-reported outcomes and patient reported-experiences, followed by the life situation of family members to a person treated with HSCT.

## 2.1 HISTORY OF ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

A significant milestone in the history of HSCT was in 1957 when E. Donnall Thomas and co-authors reported a new approach to treat cancer based on radiation and chemotherapy, followed by intravenous infusion of bone marrow (BM). Although, these patients were not cured of their cancer, the research team could show that two patients had a transient donor engraftment.[1] Donnall Thomas continued to develop this form of treatment, and in 1990 he was awarded the Nobel Prize for his pioneering work in the development of transplantation. The early results proved to be disheartening: all recipients of BM transplants died of graft rejection, graft-versus-host disease (GVHD) or opportunistic infection. However, a major breakthrough came with the identification of the human leukocyte antigen (HLA). [2] Initially, the term bone marrow transplantation (BMT) was used for the procedure because of the sole use of BM as the source of stem cells. The term HSCT was introduced after demonstrating hematopoietic stem cells (HSCs) could be retrieved from peripheral blood [3] and today a majority of the HSCTs are performed with peripheral blood stem cells (PBSC).

In Sweden, the first BMT was performed at Huddinge Hospital in 1975; however the patient died soon after the transplantation. [4] A few years later Ringdén and co-authors reported a successful BMT.[5] The number of HSCTs has increased continually and currently over 50,000 HSCTs are performed annually worldwide.[6] The latest annual activity survey from the European Society of Blood and Marrow Transplantation (EBMT) confirms a constant increase in the annual numbers of HSCTs. In 2013, over 14 000 transplantations were performed in Europe (300 of them in Sweden). [7] Figure 1 shows the 15-year trend of HSCTs in Europe.

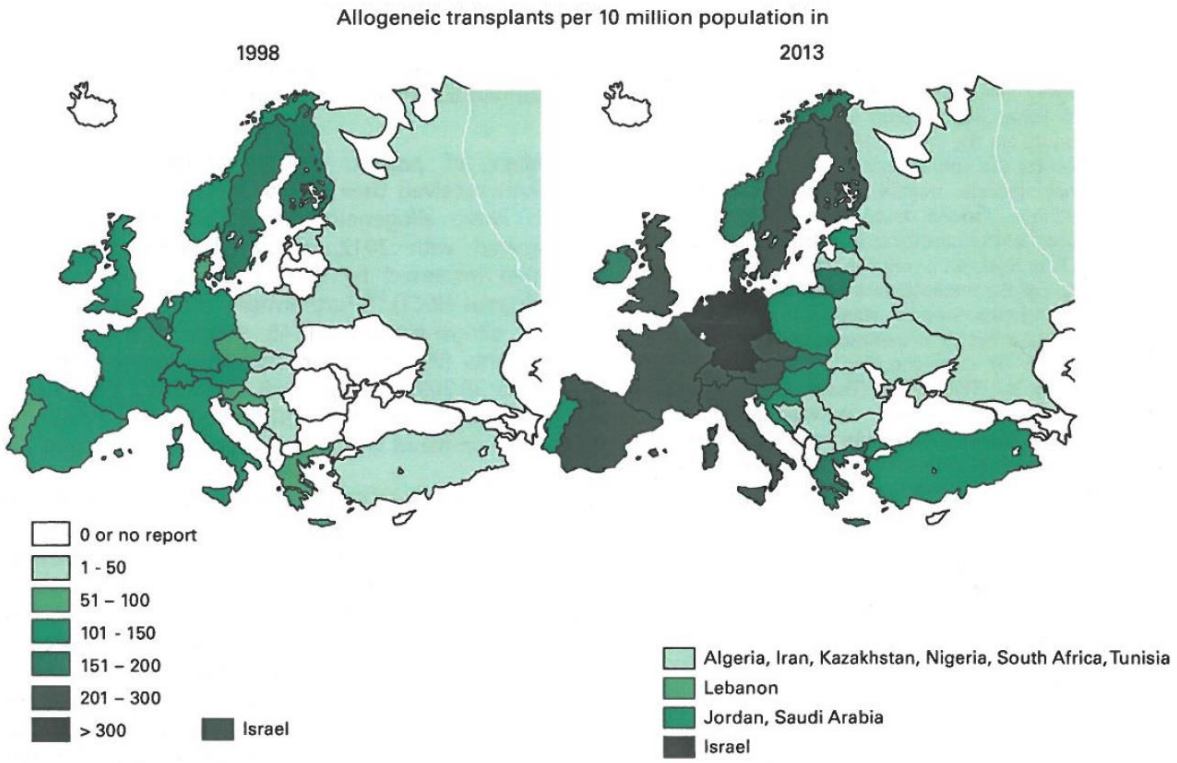


Figure 1 Transplants rates in Europe (= total numbers of HSCT per 10 million inhabitants) by participating country, showing the 15-year trend from 1998-2013. (Published with permission from Nature Publishing Group)

## 2.2 INDICATIONS FOR HSCT

Today both malignant and non-malignant diseases are indications for HSCT. Hematological malignancy represents the most common disease group and includes acute and chronic myeloid leukemia (AML and CML), acute and chronic lymphatic leukemia (ALL and CLL), myelodysplastic syndrome (MDS), lymphomas and myeloproliferative diseases.[8] In the malignant diseases, a treatment goal is the graft-versus-leukemia (GVL) effect, i.e. that the new immune system will eliminate the remaining malignant cells.[9,10] In non-malignant diseases, HSCT is a replacement therapy for patients with congenital or acquired deficiencies of marrow function, the immune system or storage functions. This includes a variety of diseases such as aplastic anemia, Fanconi's anemia, thalassemia and severe combined immunodeficiency. [11]

## 2.3 DEVELOPMENTS IN HSCT AND SURVIVAL

The aim of the transplantation is to cure the patient's primary disease, but for some patient's and diseases the aim may be long-term disease control.[12] During the past decade, the high toxicity and mortality associated with HSCT have been reduced owing to several

improvements, such as individualized pretreatment, better genomic tissue typing, and improved supportive care and treatment of infections.[13] As a result of these improvements, the number of patients eligible for HSCT has increased. The introduction of less toxic reduced-intensity conditioning (RIC) has made it possible to admit elderly patients ( i.e. those over 65 years) and those with co-morbidities (e.g. heart/kidney/liver disorders, pre-transplant infections, or diabetes). [13] The treatment is still associated with substantial risk of morbidity and mortality. Most deaths occur within the first two years post- HSCT. [14] In a survey by Wingard et al. with over 10000 patients who were alive and disease free 2 years after HSCT the probability of being alive 10 years after HSCT was 85 %. In comparison with a normal population a lower life expectancy still remains.[15] Further, overall survival and occurrence of relapse depend on many factors, including the primary disease, stage of disease at transplant, age of the HSCT-recipient, co-morbidity, donor source, conditioning regimen and occurrence of GVHD. [16]

## 2.4 THE TRANSPLANTATION PROCESS

Before recipients can be approved for transplantation they have to go through several medical examinations (heart, lung, dentist- screening, clinical status, and signs of infections). [17] When a decision has been made for transplantation, the process can start by searching for a suitable donor. The goal is to find a well HLA-matched donor to minimize the risk of severe GVHD. An HLA-matched sibling is preferred but occurs only in 30% of all cases. In most cases a matched unrelated donor is used. The third form is mismatched related donor, which also includes haploidentical parents, siblings or children[11] or cord blood (CB) from an unrelated donor. The cells intended for transplantation are harvested from (BM) through leukapheresis of (PBSCs) after mobilization of stem cells from the donor following G-CSF-stimulation, or from umbilical (CB). Today, most of the HSCTs are performed with PBSCs.

Within this phase, a parallel process starts regarding the pre-treatment planning. The choice of conditioning therapy is based on several factors: patients underlying disease, co-morbidities or age.[12] Several standard protocols are used but with a focus to be individualized for each patient to improve outcome. The inpatient procedure starts when the patient is admitted to the hospital and receives pre-treatment and the donated stem cells. Pre-treatment mainly includes two conditioning regimens, myeloablative conditioning (MAC) and non-myeloablative conditioning, also called reduced intensity conditioning (RIC). The MACs consist of high doses of chemotherapy, usually cyclophosphamide with either busulphan or fractionated total body irradiation (TBI). When using MAC the regime will cause such damage that makes a hematopoietic recovery unlikely. With RIC usually combinations of

fludarabine with a lower dose of cyclophosphamide or busulphan than in MACs, or with treosulfan are used.[12] The conditioning is necessary to avoid rejection of the donor cells, destroy malignant cells if the reason for HSCT is a malignant disease and create necessary space in the BM for the graft.[16]

After the conditioning and infusion of donated stem cells, the patient becomes pancytopenic [12] and is kept isolated during the neutropenic phase, approximately two to three weeks post-HSCT. Patients with home care usually returns to their homes on day 1 post HSCT. To await engraftment of the new hematopoietic system patients are treated in single rooms with reversed isolation and air filtration, or in rooms with laminar airflow.[18] During this phase, patients will experience side effects (e.g., fatigue, nausea, mucositis, pain and loss of appetite) related to chemotherapy, radiation, or both.[19] Risk of infections is also present during this phase, due to neutropenia and disruption of anatomical barriers (mucosal damage and vascular devices). The most frequent types of infections are sepsis and pneumonia. [16] The symptom burden can be complex and severe. Thus, to identify, prevent and manage these are of core interest for the health care professionals. In addition, GVHD – an immunological reaction- is a major complication that mainly affects the skin, liver, the gastrointestinal tract, and is significantly associated with increased morbidity and mortality after HSCT.[12] The GVHD is mediated by the host immune reaction (donor T-cells) directed towards the tissue of the patients'. Acute GVHD usually appears and is classified within 100 days while chronic GVHD usually occurs after more than three months.[16]

When engraftment occurs, patients are discharged from the transplantation unit. During the rest of the acute post-transplant phase (i.e. three months post -HSCT), the patient continues with weekly follow-ups in an outpatient setting. The patients usually have a strong need for support and care because side effects and sometimes need to be re-admitted.[20] An overview of the transplantation process is presented in Figure 2.

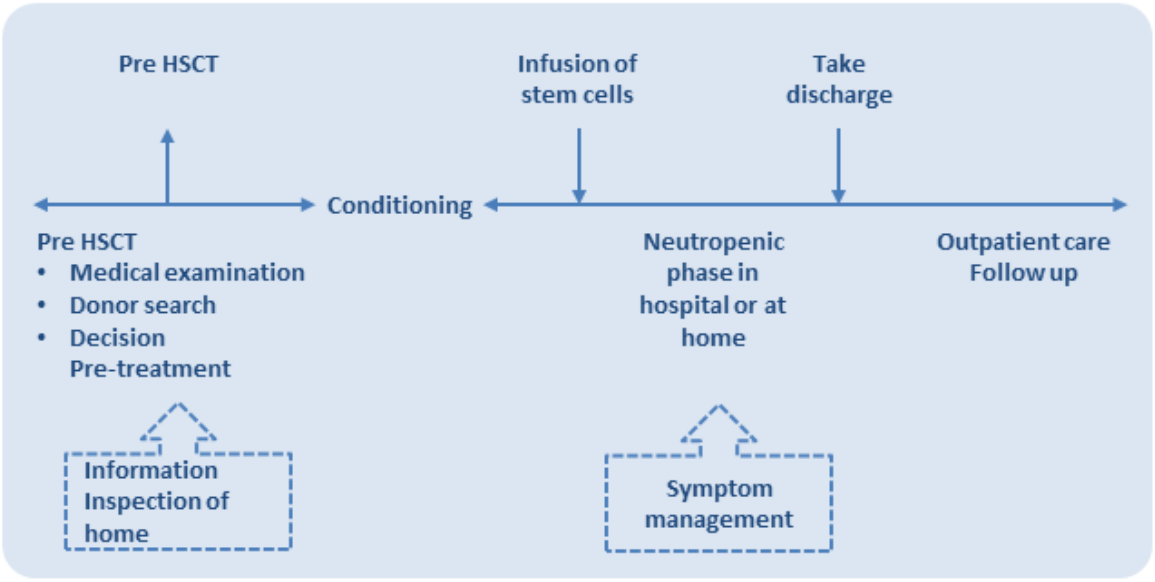


Figure 2. The transplantation process

## 2.5 DIFFERENT CARE SETTINGS DURING HSCT

For both chemotherapy and HSCT, there has been a major shift over the past decades to managed patients in the outpatient setting. The major driving force underlying this shift is the desire to improve patients' experiences, avoid unnecessary hospitalization, rationalize inpatient ward beds, and improve cost-efficiency.[21] In a HSCT setting in 1992 Russell and colleagues [22] reported of successful treatment of patients in an outpatient care facility, which became an inspiration to implement home care. Since 1998, treatment at home in the early neutropenic phase after HSCT has been an option offered to patients treated at the Center for allogeneic stem cell transplantation (CAST) at Karolinska University hospital. In 2000, Svahn et al. showed that home care was a medically safe alternative for these patients .[23] Internationally, a few other transplantation centers [24-27] have developed different types of outpatient care, but overall the majority of patients are treated in an inpatient unit.

Since the start of home care at CAST, several medical advantages of this form of home care have been described, such as fewer days with fever and total parenteral nutrition.[28] Lower incidences of acute graft-versus-host disease (GVHD) grades II-IV have also been reported in patients with home care group. Furthermore, home care and the number of days at home have been shown to be correlated with a lower risk of acute GVHD.[29]

## 2.6 ENVIRONMENT

In the latter part of the 19th century, Florence Nightingale highlighted the importance of the care environment for patient health and safety, including both the physical and psychosocial

milieu.[30] It is argued that health and well-being can be improved by supportive surroundings because people are in constant interchange with the environment.[31] For example with a consolatory atmosphere, patients' have reported a feeling of being seen and welcomed is comfortin. [32] Family members have also described a welcoming atmosphere and an open environment as something making them feel that they are an important link in the care.[33,34] It seems likely that if the members of the health care team experience work satisfaction, this will also positively affects patients' well-being. Notably in a study by Grulke et a [35] a correlation between patients' distress and nurse's distress was identified during their inpatient HSCT care, which shows the impact of the interaction in a caring relationship. Many patients treated with HSCT have had earlier experiences of care with chemotherapy. Because of the pre-treatment patients need to be isolated and often experiences a high symptom burden. At CAST patients are allowed to be outside the ward after 6 pm[36], which is considered to improve patients' experiences of isolation. The highest level of distress is experienced during the isolation period[37]; for some patients being isolated during this time may increase the burden. To be at home and in a familiar milieu is hypothesized to improve the whole experience. Yet, today we have little knowledge about how patients experience this type of care.

## 2.7 HEALTH- ILLNESS TRANSITION

Meleis[38] describes a transition as a change in health status, role relations, expectations, or abilities. Health-illness transitions often require persons to incorporate new knowledge and change behavior and they therefore have to change the definition of themselves in the context of being healthy or not.[38] Such a transition could be defined a passage from state of well-being to a state illness- to another health status, a process triggered by a change.[39] Among long-term survivors Molassiotis has investigated and described several phases in the post-HSCT trajectory. In the early phase following HSCT an adjustment to the social environment was initiated. Then a grieving phase occurred followed by a life re-evaluation phase. Loss of control and independence were also evident. If the patients had many physical problems they showed signs of despair and had a host of thoughts flashing through their minds regarding the future. [40] Therefore, the concept of transition is important in nursing in order to understand the illness trajectory and help patients integrate into a new life situation after HSCT.

## 2.8 PERSON-CENTRED CARE

Globally, person-centred care is a familiar concept within the health care sector. Furthermore, it has a broadened the illness perspective since patients' experiences and influence are prominent in the care process. In addition person-centred care focuses on interactions, strives

for an alliance between patients and professionals working together and having common grounds and goals. [41] The process in providing person-centred care is described through a range of activities working with patients' beliefs, engagement and shared decisions making. [42] In the HSCT setting a psychological consequence of the HSCT is the fear of recurrence.[43] As described by Farsi, patients perceived a treat to their life and one strategy to counter the threat was to have hope.[44] Coping has been emphasized as an important factor in explaining differences between patients' perceptions of their life situation faced with a life-threatening disease. [45] It is therefore important that the healthcare team help the patient to identify positive and individual strategies in handling the HSCT-experiences.

## 2.9 HEALTH – QUALITY OF LIFE

Health is one of the four core components in nursing science.[46] Definitions of health have evolved over time and have been shown to vary among different health disciplines. In medicine, for instance, health is often associated with objective indicators measuring the absence of disease and illness.[47] The World Health Organization's (WHO) definition on health is not only the absence of disease it also include a positive state of physical, mental and social well-being.[48] According to WHO, health should include physical health, mental health, social functioning, role functioning and general well-being.[47,49] Most people highly value experiencing a good health status and therefore it is one of several components indicative of a good quality of life (QoL).[47] The individuals' experiences and expectations of their life are two other factors that affect QoL. Within the same person, QoL can change over time because of internal developments and environmental factors. Happiness, life satisfaction, goal fulfillment, self-efficacy, and ability to cope are other factors associated with good QoL. However, these factors are relative and the circumstances that make one person satisfied with life does not always produce the same feelings for another person.[50] Thus, Fayers & Machin [51] describe QoL as a hypothetical concept that is assumed to exit. Because QoL has a unique meaning for each individual, it cannot be directly measured or observed.

### 2.9.1 Patient-reported outcomes measures

To understand the impact of illness in relation to HSCT it is important to capture information from the patients' experiences of their treatment. Thus, the use of health- related quality of life (HRQoL) instruments may be more appropriate in a clinical setting. Bowling [49] defines HRQoL as optimum levels of a person's mental, physical, role and social beliefs, and perceptions in relation to health, fitness, life satisfaction, and well-being. In the clinic it should also include assessment of patient's level of satisfaction with treatment, outcome, health status and future perspective.[49] The evaluation of cancer treatment based on medical

outcomes has been particularly highlighted and can further be related to the change in healthcare system towards a more patient-centered focus. The concept patient reported outcomes (PRO) has been defined by the Food and Drug Administration (FDA) as any report relating to the status of a patient's health condition that comes directly from the patient, without interpretation of the patient's response by a clinician or anyone else.[52] Knowledge about PRO gives the health care professionals' information and understanding of the impact treatment has on the patients from the patients' perspective. Therefore, PRO can, for example, be measured by HRQoL.

To measure different PROs a large number of questionnaires have been developed. These are often classified as generic, diagnose-specific or domain-specific questionnaires.[47,53] Generic instruments are intended for use across a wide range of medical conditions. They often are multidimensional tool to assess different HRQoL domains. Using generic instruments has an advantage because of the possibility to compare results across patients with different disease profiles as well with the general population. However, a risk could arise as the instrument may not properly address issues of relevance to specific diseases.[47,53] An example of a generic instrument is The Medical Outcome Study Short Form Health Survey (SF-36).[54] The SF-36 is a set of generic, coherent, and easily administered QoL measurements. It is a patient self-reporting questionnaire to monitor and assess care outcomes for adult patients.

To be able to assess disease-related changes in HRQoL it is more common to use diagnose-specific instruments. Within cancer diagnosis the European Organization for Cancer Research and Treatment of Cancer Quality of life Questionnaire (EORTC QLQ-C30)[55] is widely used. In the HSCT setting it is recommended to be supplemented by a questionnaire module specific for High-Dose Chemotherapy module HDC29.[56] Other questionnaire used after HSCT are the Functional Assessment of Cancer Therapy Bone Marrow Transplant (FACT-BMT) [57] and the Symptom Frequency, Intensity and Distress questionnaire for Stem Cells Transplantation (SFID-SCT). [58]

Domain-specific instruments are used to address specific aspects of HRQoL in more detail and they are not always specific for cancer patients. In this thesis questionnaires regarding self-efficacy (GSE) [59] and anxiety and depression (HADS) [60] were used.

#### *2.9.1.1 Patient-reported outcomes after HSCT*

Long-term survivors of HSCT have reported disease- and treatment-related problems that may last for a considerable time, with possible negative effects on well-being and QoL. [61-66] A summary of the effects of the different HRQoL domains are followed. Physical functioning

often shows rapid declines after HSCT and improves after about 100 days [19], but physical symptoms may occurs many years after HSCT. [67] During the acute post- HSCT phase, symptoms (e.g., fatigue, nausea, pain, diarrhea and mucositis) frequently occurs. [19] Long-term survivors have reported such symptoms as tiredness and lack of energy, low back pain, difficulty sleeping, decreased sexual activity to be particularly distressing. [67,68] As may be expected, given the uncertainty, emotional functioning shows a high level of distress prior to and after HSCT, although improvements are known to occur over time.[69] Further, an association between depression and fear of recurrence has been shown.[43] Anxiety and depression occur among long-term survivors but take place more often in patients with a high symptom burden.[63,70,71] Social functioning is also lower in patients than in the general population prior to HSCT, but often returns to baseline within the first year after HSCT. [69]

Some related factors to patients health after HSCT have been identified, including GVHD [63,71], age [70], gender [70], time since HSCT [67], high symptom distress [67,68] and returning to work [72]. Many patients report a general good health despite the occurrence of various side effects. [68,73] One possible explanation for this discrepancy relates to the notion of response shift i.e. because of the serious nature of their illness and difficult treatment patients might alter their view on life, accepting a lower level of functioning. This shift could be explained by a reappraisal of their values because of personal growth after cancer diagnosis and intensive treatment.[74,75]

### 2.9.2 Patient-reported experience measures

How people experiences health services is an important component to improve quality of cares. [76] The concept patient-reported experience measures (PREM) is used to understand patients' views on their experiences while receiving care, rather than the outcome of care, often measured through patient satisfaction or patient experiences.[77] To measure PREs is important not only to guide service improvement, but also because a person's experiences of care may be linked to clinical outcomes and costs.[76]

Areas to investigate include encountering, information, participation within the care process, confidence in the health care providers, and access to care. All these areas can be included in the concept of PREM. In this thesis the Sympathy- Acceptance-Understanding-Competence (SAUC) model, which is an action-theoretical nursing theory, was used to investigate patients' experiences of support and care. The SAUC model uses the individual as an acting subject. The theory that individuals are an acting subject stems from an understanding that they want to be engaged in actions and that they have a self-relationship. The confirmation

process appears in the interaction between caregiver and patient as a dynamic process, structured in the SAUC model's three phases: as a nursing process (the professional's person-support), an interactive confirmation process (the professional's self-support), and an intra-active confirmation process (the patient's self-relation support). [78,79] In the current thesis, in-depth interviews were conducted (this is another way to collect PREM) to gain a deeper understanding for patients' lives and care-related experiences after HSCT.

For patients diagnosed with cancer various PREM questionnaires have been developed. The European Organization for Cancer Research and Treatment of Cancer (EORTC), has developed the Cancer in-patients satisfaction with care measure (EORTC-IN-PATSAT 32). The questionnaire contains 32 items on patients' perceptions of the quality of doctors and nurses, the care organization and the hospital environment.[80] To evaluate the information received by patients in different stages of their disease, The EORTC information module (EORTC QLQ- INFO 25) covers several areas (information about the disease, medical test, treatment and other services).[81] In this thesis, the SAUC was used to measure self-evaluated satisfaction of care and support. It contains of 31 items representing four scales: Satisfaction with care in general (5 items), Person-support (7 items), Self-support (10 items) and Self-relation support (9 items).[78,82] Because the PREM mostly measures the patients' experiences with the structure and process of care organization, PROs primarily focus on outcomes related to treatment. Figure 3 illustrate the different outlooks of PREM and PROM according to Donabedian. [83]

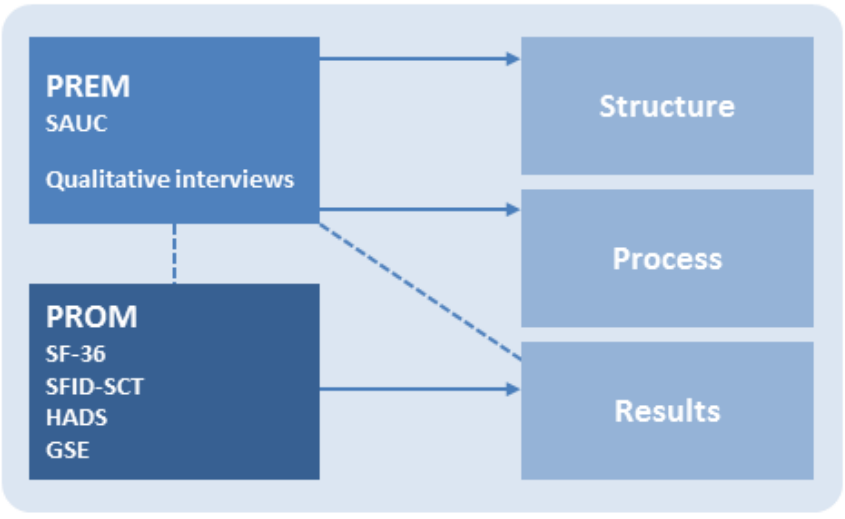


Figure 3 Illustration of relation of PREM and PROM, as a structure, process and outcome (Adapted from PROM center) [84].

## 2.10 FAMILY AND LIFE SITUATION AFTER HSCT

The concept of family has a unique meaning for each person and is thus difficult to define. A patient might have stronger bonds to persons outside the immediate family. Therefore, a natural way would be to broaden the concept of family to include persons that have a significant importance to the member of the family. One definition that has been used is - a person that the patient chooses to be related to. [85] Thus, a family can consist of a number of individuals with strong bonds to each other; in this context, family members might be children, spouses, close friends, neighbors, or colleagues. The significance of family for health and illness, as well as for good nursing has been highlighted by Wright and Leahey.[85] They have applied a system theory to understand the family as a whole unit. From this perspective, if one member of the family is diagnosed with cancer, the entire family will be affected. Each family member might experience the situation differently.

In the literature different terms are used for caregivers with a close relationship to the patient (e.g., family caregivers, spouses, family members, relatives, or next of kin). There may be some differences in meaning, but in this thesis the different terms are considered synonymous.

Similar to other cancer populations [86,87] spouses are often the main source of emotional and practical support for the patient undergoing HSCT. [88] Further, the spouse is likely to be the person who monitors the patient at home. In the context of HSCT in particular the role extends beyond emotional support to include providing increasingly more complex management of symptoms.[89] Recently, a study reported that family caregivers may be at risk of psychological distress as a result of their role in providing care for a partner undergoing HSCT. [90] Furthermore, it seems that caregiver distress is highest before HSCT and decreases over time during the post-HSCT phase. Female gender and high patient symptom burden are factors that have been shown to be associated with higher levels of distress. [88] Physical symptoms such as fatigue, sleep disturbance, loss of appetite and pain are often experienced. [91] Also the family dynamics may be affected, the roles and tasks within the family structures changes.[92] The HSCT-process also often affects family member ability to work full time, resulting in a loss of income.[93]

# 3 RATIONALE

Overall, HSCT has a significant impact on a patient physical and psychosocial well-being, as well as their family members'. Previous data indicate that home care, during the early acute transplantation phase after HSCT is safe with a number of positive medical outcomes. Thus an important outcome of the treatment is the impact the disease and treatment have on patients' and family members' life situation. However, research studies on patient and family members' experiences and outcomes of different care settings during HSCT are limited.

An intention of this thesis is therefore to identify both the strengths and weaknesses from provided home care and hospital care during the acute post transplantation phase after HSCT. Knowledge obtained through this thesis can give a deeper understanding of patients' and family members' life situations and experiences after HSCT. Moreover, this thesis provides information on different aspects of care that can serve as a foundation for the development of interventions specifically designed to improve care and general life conditions for the entire family.

# 4 AIMS OF THE THESIS

The overall aim of this thesis was to describe patients and family members' life situation after allogeneic stem cell transplantation (HSCT) and their experiences from two different care setting (in the patient's home or the hospital). The specific aims of the four studies (I-IV) included in the thesis are as follows:

I. To describe and compare patients' satisfaction and experiences of care and support during the acute post-transplantation phase after HSCT when being treated in hospital or at home.

II. To describe patients' life situation and experiences of care in two different care settings, the patient's own home or in hospital during the acute post-transplantation phase.

III. To compare general health, symptom occurrence and self-efficacy in long-terms adult survivors who had received either home care or hospital care during the early neutropenic phase after allo-HSCT, and to investigate whether demographic or medical variables were associated with general health or symptom occurrence in this patient population.

IV. To describe family members' life situation and experiences of care in two different care settings, the patient's home or in hospital during the acute post-transplantation phase.

# 5 METHODS

## 5.1 DESIGN

To provide a broad understanding of the life situation among patients after HSCT as well as their family members both quantitative (I, III) and qualitative methods (I, II, IV) were used. Data were collected through questionnaires, qualitative interviews and patient medical records (Table1).

A quantitative/qualitative descriptive design was chosen for study I in which data were collected with the SAUC questionnaire and patient medical records to describe and compare patients' satisfaction and experiences of care and support.

To compare adult survivors (who received either home care or hospital care during the early neutropenic phase) general health, symptom occurrence and self-efficacy after HSCT a cross-sectional design was used in study III. Patient-reported data were collected by the SF-36, SFID-SCT, HADS and GSE.

A qualitative descriptive design was applied in study II and IV. The data gave the patients' experiences of their life situation and experiences of care in different care settings (II). Experiences of family members (IV) were collected through qualitative interviews.

Table 1. Overview of studies I-IV in the thesis.

| Study | Study design | Participants | Data collection | Data analysis |
|---|---|---|---|---|
| I | Qualitative and quantitative descriptive | **41**( H *n* = 22, HC *n* = 19) | Questionnaire SAUC Medical records | Descriptive statistics, The Mann-Whitney *U*- test, chi-square test, Cronbach's alpha. Qualitative deductive content analysis |
| II | Qualitative descriptive | **15** (H *n* = 6, HC *n* = 9) | Qualitative interview Medical records | Qualitative inductive content analysis |
| III | Cross-sectional | **117** (H *n* = 78, HC *n* = 39) | Questionnaires SF-36, SFID-SCT, HADS, GSE Medical records | Descriptive statistics, The Mann-Whitney *U* –test, chi-square test or Fisher's exact test, Logistic regression analysis |
| IV | Qualitative descriptive | **14** (H *n* = 7, HC *n* = 7) | Qualitative interview | Qualitative inductive content analysis |

Abbreviations: H = hospital care, HC = home care.

## 5.2 SETTING

Patients were all treated at the transplantation center, Karolinska University Hospital, Huddinge, Sweden. The transplantation center is the largest of its kind in Sweden, performing approximately 80-90 allogeneic HSCTs every year. It is a regional center for HSCT, but patients from other counties in Sweden and from other countries are also treated here. Before HSCT, patients who fulfilled the criteria for home care [36] (described under home care) had the opportunity to choose between hospital care or home care during the neutropenic phase. The conditioning and stem cell infusion (PBSC, CM or BM) were administered in the hospital, and all patients received conventional prophylaxis against GVHD [94] bacterial and fungal infections.[95] Patients with home care usually returns to their homes on day 1 post HSCT. After discharge, all patients were treated in the outpatient clinic, see The transplantation process (Figure 2). The Swedish Social Insurance system supports the family members, i.e. the system provides benefits for the care of a closely related person. This means the family member could take a leave of absence from work (during the neutropenic phase)

and received financial support based on annual income and on the extent to which he or she is still working. [96]

### 5.2.1 Home care

The following criteria (Table 2) had to be fulfilled before patients destined for home care could return home after HSCT. During the early neutropenic phase, patients in home care were visited and cared for on a daily basis by experienced nurses from the transplantation center. In addition, each afternoon a physician called and checked the patient's well-being in order to make appropriate modifications concerning examination, treatment, and medication. If there were any indication of unstable vital parameters that could not be taken dealt with at home, the patient was re-admitted to the transplant center.[36]

Table 2. Criteria for home care.

- A family member or friend is able and willing to stay with the patient during treatment at home.
- The temperature of the hot water must be at least 50°C.
- No pets or potted plants are allowed in the home.
- The bed linen used by the patient has to be laundered three times a week.
- The patient's home has to be within one to two hours driving distance from the transplant center.

### 5.2.2 Hospital care

Patients receiving hospital care was treated in conventional single rooms with reversed isolation and air filtration. The room included a TV, a DVD player, and an exercise bicycle. Patients were encouraged to have one family member or friend stay with them around the clock. The patients could take a walk outside the hospital after 6pm on weekdays and at any time during weekends. Nurses and physicians provided supportive care according to the patient's health status. Pot plants were not allowed in the ward because of the risk of infection.

## 5.3 SAMPLE

A total of 173 (study I *n*=41; study II *n*= 15; study III *n*= 117) patients and 14 family members (study IV) were included in the four studies of the thesis. In study I data were collected from 2006-2009; in study III data were collected in May 2009 and in study II and IV data were collected during May to November 2012.

### 5.3.1 Inclusion criterion

Inclusion criteria for study I and II were age ≥ 18 years and ability to read, speak, and understand the Swedish language. Patients fulfilling the criteria for home care (see under Setting) had an opportunity to choose home care during the acute post-transplantation phase.

In study III, the inclusion criteria and eligibility for participation were adult survivors who underwent an HSCT between January 1998 and June 2008 because of a hematological disease, were cared for at home or in hospital or during the neutropenic phase, ≥ 18 years at HSCT, lived in Sweden and between 19-65 years of age at time of data collection in May 2009. Patients not living in Sweden (i.e. without a Swedish personal identification number) and those between <18 and >65 years at the time of data collection were excluded. Because of administrative failures 3% of the eligible patients did not receive the participation request. Study information and a questionnaire were sent out by post (n=166) to the eligible patients. A response rate of 70% was achieved after one reminder (Figure 4).

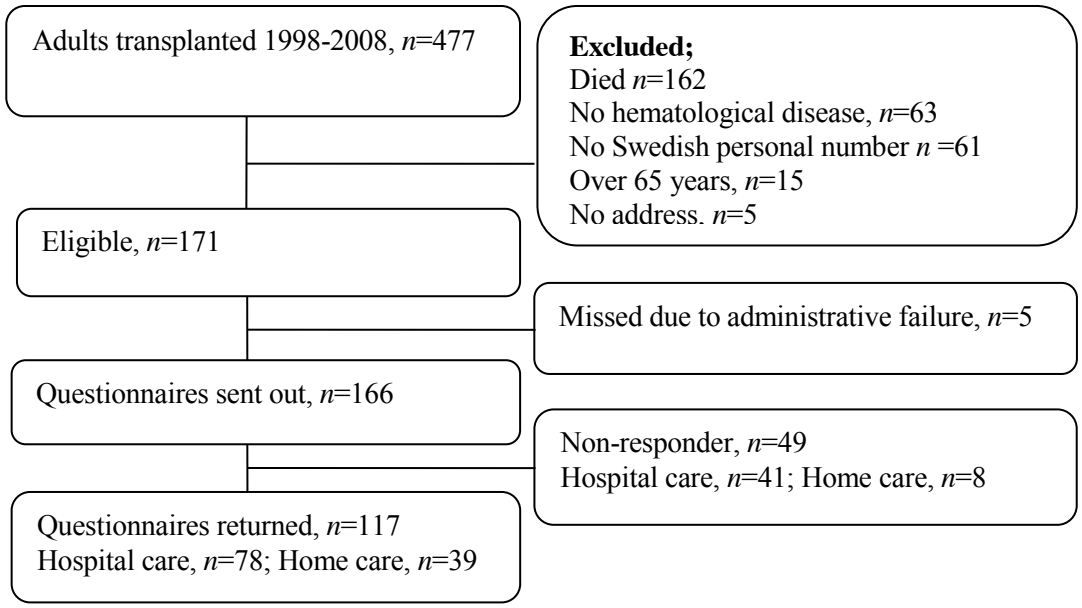


Figure 4. Enrollment of study participants in study III.

Participants in study IV were recruited through study II where patients were asked to nominate a family member who assisted them with their daily living. Inclusion criteria regarding choice of family member for a patient were: the person was a member of the patient's family, over 18 years old, and able to read and spoke the Swedish language. Furthermore, the interview had to take place within six months after HSCT.

### 5.3.2 Characteristics of the participants

Study I

Altogether, 41 patients (*n*=20 females, *n*= 21 males) were included in the study. The patients were cared in hospital care (*n*=22) and home care (*n*=19). The median age of patients in hospital care was 51 years and 56 years in home care. Most patients were married or cohabiting. Acute leukemia was the most common diagnosis. The majority of the patients received RIC and PBSC.

Study II

The sample consisted of 6 females and 9 males. The median age was 55 years (range 30 to 68). The majority (9/15) had experience of both hospital and home care during the neutropenic phase. Most of the patients were married or cohabiting. Acute leukemia was the most common diagnosis. Most patients received RIC and all received PBSC.

Study III

Altogether, 117 patients participated (*n*=51 females, *n*=66 males) with a median age of 49 (21-65) years and median time of 5 (1-11) years since HSCT. The majority of patients (*n*=78) were cared for in hospital and the remaining (*n*=39) at home. Fifty percent had a college degree and 60% were working at the time of data collection. Forty-three percent of patients had acute leukemia; 59% received MAC and 41% received RIC. As part of the conditioning, 42% received total body irradiation (TBI). The majority (78%) received PBSC.

Study IV

In this study there were seven females and seven male family members. Their relationship to the patient was wife/husband/cohabiting (*n*=10), parent (*n*=3) or sibling (*n*=1). The median age of the participants was 54 years (range 34 -77 years). Eleven of the participants (78%) had experience of home care during the neutropenic phase.

## 5.4 DATA COLLECTION

Study I

Patients completed the SAUC-questionnaire[78,82] at the time of discharge from the transplant unit. The SAUC measures self-rated satisfaction of care and support. It contains 31 items representing four scales: *Satisfaction with care in general* (5 items), *Person-support* (7 items), *Self-support* (10 items), and *Self-relation support* (9 items). All items are rated on a

seven point Likert-scale, where a higher score indicates that patients are more satisfied with the care and support. For each item, an open-ended question was included that encouraged patients to describe their personal experiences.

Clinical characteristics were obtained from the patients' medical records including diagnosis, conditioning, stem cell source, donor type, acute GVHD, chronic GVHD and length of stay during HSCT.

Study II

A letter about the study was sent to the patient by one of the authors (KB), when patient had been discharged from the transplantation center. A clinical nurse at the outpatient clinic gave information about eligible patients. After a week, the patients were contacted by telephone and asked whether they were interested in participating in the study. All participants were interviewed by KB at a time and place chosen (in the patient's home or in an outpatient room) by the participant.

An interview guide [97] was developed to identify the following domains; decision about the care setting, to be in different care settings, contact with healthcare staff, the relationship with the families, and the patient's own health and life situation. The patients were asked to describe their experiences in these domains during the acute post-transplantation phase. During the interviews, follow-up questions were asked ("What do you mean?" or "Could please you describe this in more detail?"). Field notes were collected after each interview. The recorded interviews were immediately reviewed in an endeavor to obtain an immersed knowledge of the data. This material was saved for future reference. The interviews took place between 29 and 120 days after HSCT and lasted a median time of 53 minutes (range 23-91 minutes). All interviews were audiotaped with the participant´s consent and transcribed verbatim. Medical information diagnosis, conditioning, stem cell source, donor type, length of stay and re-admissions were obtained from the patients' medical record.

Study III

Data were collected through a larger survey on life situations after HSCT in survivors.[98] A Swedish comprehensive questionnaire, previously used for women with breast cancer[99], was adapted to fit the patient group.[98] The questionnaire comprised a range of different validity- and reliability-tested scales or parts of scales.

The study variables were *general health*, *symptom occurrence*, and *self -efficacy*. *General health* was assessed using one item from the SF-36 [54]: 'How would you rate your overall

health?. The single item has five response alternatives: ‘excellent’ (100 points), ‘very good’ (75 points), ‘good’ (50 points), ‘fair’ (25 points), and ‘poor’ (0 points). The responses were also divided into ‘good health’ (>50 points) and ‘poor’ health (<50 points).

*Symptom occurrence* was assessed with part of the SFID-SCT developed by Larsen et al. [58] It consists of 46 items about patient symptoms and asks whether the symptom was present during the previous week. The 15 most frequent symptoms were ranked and the number of symptoms per patient was summed.

*Symptoms of anxiety and depression* were assessed using the 14- item Hospital Anxiety and Depression Scale (HADS). [60] This scale is made up of two subscales, one for depression (seven items) and one for anxiety (seven items). The items are rated on a four-point Likert scale. Subscale scores range from 0 (no distress) to 21 (maximum distress). The responses were divided into none (0-8) or case (9-21). [60,100] Cases are considered clinically significant.

*Self-Efficacy* was measured with three items derived from the General Self-Efficacy Scale (GSE). The GSE was created to predict coping with daily difficulties as well as adaptation after experiencing various kinds of stressful life events. [59] Each item refers to successful coping and implies an internal-stable attribution of success. Based on psychometrical analysis of item’s function [101], these three items from the scale were chosen for inclusion: (1) ‘I’m good at handling unexpected situations’, (2) ‘I can solve most problems if I really want to’, and (3) ‘No matter what happens in my life, I feel confident I can handle it’. Each item is rated on a five-point Likert scale. The alternative response options were ‘always’ (100 points), ‘often’ (75 points), ‘sometimes’ (50 points), ‘seldom’ (25 points), and ‘never/hardly ever’ (0 points). The means for the three items were summed and divided by the total number of items. The higher the score, the better self-rated self-efficacy.

Demographic characteristics included gender, age, marital status, living situation, and occupational status. Clinical characteristics were obtained from the patients’ medical records and included diagnosis, conditioning, stem cell source, donor type, acute GVHD, chronic GVHD, and clinical status at HSCT and at the time of data collection.

Cronbach’s alpha was calculated in study I and III (table 3). Alpha values were higher than 0.70 and therefore considered acceptable. [102]

Table 3. Cronbach's alpha coefficient calculated for SAUC, HADS and GSE.

| Questionnaire | Dimension | Items | Cronbach's alpha |
|---|---|---|---|
| SAUC | Satisfaction with care in general | 5 | 0.67 |
| | Person-support | 7 | 0.84 |
| | Self-support | 10 | 0.63 |
| | Self-relation support | 9 | 0.35 |
| HADS | Symptoms of depression | 7 | 0.85 |
| | Symptoms of anxiety | 7 | 0.87 |
| GSE | Self-efficacy | 3 | 0.84 |

Study IV

Participants in this study were the family member of patients who participated in study II. More specifically, the patients (study II) were asked to nominate one family member who assists them in their daily living. A letter about the study was sent and thereafter potential participants were contacted by telephone whether they were interested in participating in the study. All participants were interviewed by KB at a time and place chosen (in patient's own home, in a room in the outpatient setting, or at work) by the participant. The interviews were performed as described in study II. An interview guide was developed regarding decisions about the care setting, contact with health care staff, the family member's role in the care given, their relationship with the patient, and the participant's health and life situation. A pilot interview was conducted to test the interview guide, but this was not included in the study because one of the inclusion criteria was lacking ("member of the patient's immediate family"). In study IV the interviews, lasting an average of 94 minutes (range 35-136), took place between 4 and16 weeks after the patient's HSCT.

## 5.5 DATA ANALYSIS

### 5.5.1 Qualitative content analysis

Study I

To analyze text from the open-ended questions, a deductive qualitative content analysis [103] approach based on the SAUC model [78,82] was chosen. The analysis of the text began with reading all written answers to gain an understanding of the whole and obtain a broad sense of the meaning.[104] Thereafter, the text was sorted using a structured categorization matrix (Table 4) based on the SAUC model's three phases: person-support, self-support, and self-relation-support. [82] All text was then divided into meaning units under each sub-category. The final

step was to label units of codes. The analyses of codes were analyzed to a manifest level. Quotations were selected to illustrate the SAUC model's three phases.

Table 4. The structured categorization matrix using the SAUC-model.

| **Person-support** | **Self-support** | **Self-relation support** |
|---|---|---|
| Security | Motivation | Identity |
| Freedom | Partnership | Control |
| Validation knowledge | Uniqueness | Truth |
| Action knowledge | Maturity | Life-meaning |

Study II and IV

Content analysis (CA) with an inductive approach was chosen to analyse the data in study II and IV, CA is a dynamic form of analysis of text that is oriented towards summarizing the contents of the data. It focuses on differences and similarities in the data and can be applicable at various depths. [105] The analysis started with several readings of the transcribed text to obtain an overall sense of the content and whole. [104] The text content that were related to the study aims were labelled with codes. All codes were continuously compared to identify differences and similarities. Based on the codes, subcategories and categories were developed. Abstraction and interpretation of the categories were done as far as was reasonable and possible [103] to express the manifest (Study II) and latent (Study IV) content of the text. [104] To assess the validity of the analysis process, a comparison was made with nine of the transcripts codes, a process known as inter-rater reliability [106], by the authors of the studies. Rather than having a numerical index of agreement, consensus was reached by discussing the codes meaning in relation to the transcript. The categories were discussed extensively between all authors. Quotations were selected to illustrate the participants' experiences of their life situation after HSCT.

### 5.5.2 Statistical analysis

Study I

Descriptive statistics were used to summarize the demographic and clinical characteristics of the study sample. Because of the type of data and the sample size, non-parametric tests were used. The Mann-Whitney *U* test was performed to test differences between the two independent groups (hospital care and home care) in variables at an ordinal, interval, or ratio

level. Differences between the groups in variables at a nominal level were tested by applying the chi-square test. A statistical significance level of $p < 0.05$ was used.

Study III

Descriptive statistics were used to summarize the demographic and clinical characteristics of the study sample. The Mann-Whitney *U* test was conducted to test differences between two independent groups (e.g., home and hospital) in variables at the ordinal, interval, or ratio level. Differences between the groups in variables at a nominal level were tested using the chi-square test or, if appropriate Fisher's exact test. A statistical significance level of $p < 0.05$ was used. Logistic regression analysis was performed to analyze the dependent variables, which were 'general health' (good vs. poor) and 'symptom occurrence' (<15 symptoms vs. ≥15 symptoms)" for to determine their association with the following independent variables: caring context (home /hospital ), gender (male/female), diagnosis, donor (HLA-identical sibling/unrelated), clinical status (high/low), age (< 49/≥ 49 years), conditioning (MAC/RIC),TBI (yes/no), aGVHD (yes/no), cGVHD (yes/no), stem cell source (BM, PBSC/CB), time since HSCT (< 5/≥ 5 years) and self-efficacy [0 points ('never/hardly ever') – 100 points ('always')]. The 95% confidence interval (CI) and estimates of the odds ratio (OR) are presented. In the univariate analysis, the independent variables with a *p*-value of <0.2 were introduced into the multivariate backwards stepwise analysis. [107]

Table 5. Overview of statistical analysis in study I and III.

| | **Study I** | **Study III** |
|---|---|---|
| Descriptive statistics | x | x |
| Mann-Whitney *U* test | x | x |
| Chi-square test | x | x |
| Fisher's exact test | | x |
| Logistic regression analysis | | x |

Statistical analysis was performed using SPSS version 20.0 (SPSS Inc., Chicago, IL, USA) and Statistica version 10.0 (Statsoft Inc., Tulsa, OK, USA).

# 6 ETHICAL CONSIDERATIONS

Research involving patients treated with HSCT, which is very demanding, raises ethical considerations that must be addressed during the entire research process. The principles of research ethics such as informed consent, autonomy and integrity, and avoiding causing the participants harm [108] were considered throughout this research project.

To obtain informed consent all participants were provided with a letter describing the aim of the study, the voluntary nature of their participation, and their right to withdraw at any stage in the research process without consequence. Confidentiality was guaranteed by coding the questionnaires and interviews. When interviewing all patients were in the early phase following the recovery from HSCT, sometimes with a high symptom occurrence therefore a reflected awareness in meeting with them was necessary. The potential risk of participation during the interviews was a psychological character and preparedness if they were reminded of distressing situations or over their present life situation.

All four studies were granted ethical approval by the Ethical Review Board, Stockholm, Sweden Dnr 449/97, 2009/540-32, and 2010/1532-31/2.

# 7 FINDINGS

The findings are presented as *Patient-reported experiences* (study I and II) in which patients' experiences of care, support and their life situation in the short-term perspective are presented. The long-term effects after HSCT are presented as *Patient-reported outcomes* (study III) with respect to the patients' health and symptom occurrence. The experiences of family member's in the short-term perspective are presented in *Family members' experiences* (study IV).

## 7.1 PATIENT-REPORTED EXPERIENCES

Study I

The patients in the hospital care group and the home care group showed high satisfaction with the care and support they received during the acute post-transplantation phase. A statistical significant difference was found regarding satisfaction with care in general between patients in home care 7.0 (6.0–7.0) and patients in hospital care 7.0 (5.0–7.0) ($p = 0.05$). No statistically significant differences were revealed in the three scales of support (table 6). Data from the open-ended questions were analyzed with qualitative deductive CA and are presented through the three levels of the SAUC model: person-support, self-support, and self-relation support.

Table 6. Patient satisfaction with support.

| | **Home care ($n = 19$)** | **Hospital care ($n = 22$)** | ***p*-value** |
|---|---|---|---|
| Person-support | 5.0 (4.3–6.0) | 5.2 (3.7–7.0) | 0.45 |
| Self-support | 6.4 (4.5–7.0) | 5.7 (3.9–7.0) | 0.40 |
| Self-relation support | 5.9 (3.9–7.0) | 6.0 (3.4–7.0) | 0.40 |

In **Person-support**, *Security* was identified with concern/empathy and support by patients regardless of caring contexts. A feeling of being cared for and receiving adequate support from the health care team with high competence was expressed. Different caring routines and a daily meeting with the nurse at home also made the patients feel safe. Patients expressed *Freedom* as being listened to; discussions that took place in a friendly environment, and the staff took time to listen to their needs. The patients felt getting answers to individual questions was important, but patients in hospital care stated that they did not always receive answers. *Validation knowledge* constitutes aspects of feeling uncertainty about the future.

Patients in hospital care related uncertainty to their state of health. *Action knowledge* was described as having trust in the competence of the healthcare team irrespective of care setting. Action knowledge was also described by patients in hospital care as being part of their own self-care activities.

In **Self-support**, *Motivation* included feelings of strong encouragement from the health care team and receiving continued and updated information about the treatment procedure. In *Partnership*, the influence of the care was expressed either as a positive experience or as a negative experience, regardless of care setting. Describing *Uniqueness*, the patients in home care expressed it as person-centered care; in hospital care, person-centered cares was experienced as variation among the health care team. Patients in hospital care also pointed out that there were times when the caring routines dominated. In *Maturity*, patients described the importance of having faith in themselves. Other sources of confidence derived from family members, friends, a belief in God, and from the staff, which surprised them. They also expressed great confidence in the HSCT treatment.

In **Self-relation support**, for *Identity*, patients described one main goal: to recover from the illness and the side effects from HSCT therapy. Other goals were return to work, socialize with friends, and to interact with one's own pet. The long recovery period was identified and associated with many restrictions, limitations, side effects and uncertainty of the future. Being able to stay at home during the acute post-transplantation phase was unique, and patients also mentioned that being at home would help them to recover more quickly. To be able to influence their life situation was covered in *Control*, and there was awareness of the uncertainty of whether the HSCT would succeed or not. In this study, there were no data relating to *Truth* and *Life-meaning*.

Study II

In-depth interviews with the patients' about their life situation and experiences of care were performed. The manifest content analysis identified four categories: *To be in a safe place*, *To have a supportive network*, *My way of taking control*, and *My uncertain way back to normal*.

*To be in a safe place*

Decisions to be treated at home were often based on knowledge of the positive medical outcome with home care (HC). Misunderstandings regarding some criteria became apparent, such as pets attendance and a sense of fear of doing the wrong thing (e.g., with hygiene routines, but this was reduced after contact with the home care nurses). Participants felt safe

at home because of the support from the nurse, the closeness distance to the hospital and the 24/7 telephone support. Positive advantages of HC were identified: eating better, more physical activity, a sense of freedom, being with the family, and the greater possibility to live a normal life. Some participants also stated being at home probably helped them to recovery more quickly and not to feel so ill. Negative aspects of HC were identified: delayed changes to medication and shortage of nursing staff led to visits to the hospital (i.e. not for any medical reasons). Some of the participants in HC were re-admitted but this event was expected and as soon it was medically safe they returned home. Being in a hospital and isolated depended on the participants' health status. Living with restrictions because of isolation had little effect because the participants knew that this would be for a limited time. The days were filled with many controls under the guidance of the health care staff, which was experienced as bothersome. On the other hand, they understood the reason for this control and that gave them a feeling of safety and security. Negative factors included the hospital surroundings, difficult in eating, and the negative effect on sleep. All participants stated if health were impaired, it was safer to be in hospital. In conclusion, everyone expressed satisfaction with the care as being safe.

*To have a supportive network*

Person-centered care was experienced especially in receiving adequate and timely symptom management with many alternatives available to relieve symptoms. The participants expressed the health care team's high degree of competence and often long experience with HSCT. The high quality of care encouraged the participants to have confidence in the team and in HSCT. Positive factors in meetings with the health care team were identified: a personal touch, continuity, feelings of encouragement, and enthusiasm of the team members working in the transplantation center. The importance and responsibility of family members to be able to be at home was evident. Many participants in the hospital had some company during their stay. The importance of informing others about the HSCT, even though it is rather difficult to explain was expressed. The participants experienced large variation in support and understanding from friends and colleagues at work.

*My way of taking control*

The effect of the HSCT was evident for all participants who experienced physical side effects (e.g., fatigue, pain, nausea, and eating problems). The approach and attitude to the illness and HSCT were described on an individual basis. One way of taking control was to gain knowledge based on their own needs. Before the HSCT, there had been many information

meetings; it had often been difficult to digest and predict how it would actually turn out. Another strategy was to take in information gradually during the pre-HSCT phase. The participants mentioned the complexity in understanding the HSCT. The significance of receiving honest and positive information was underlined. Knowing more also meant that they could be more involved in certain decisions regarding care. To set up goals sometimes only for a day or week and to live in the here and now were ways of managing the many side effects and the uncertainty about the future. A third approach was also to make daily routines to structure the trajectory.

*My uncertain way back to normal*

Living with side effects of HSCT proved to be a challenge for the participants, especially not knowing how long times they will be currently. Hope of being cured was another strong component of the interviews. It was obvious to everyone that they had an uncertain future with a risk of relapse. In cases of relapse the majority would choose to repeat HSCT therapy. Some patients realized that they were at the start of a long recovery including having to live and deal with countless medical follow-ups. All participants stated that the restrictions were an obstacle to living a normal life and posed an uncertainty about how and for how long they would have to live with the restrictions. They missed the more personal and dynamic restrictions in relation to their health and living situation. Their body had changed and they longed to return to their normal existence before the onset of the disease and treatment.

## 7.2 PATIENT- REPORTED OUTCOMES

Study III

Overall, there were no significant differences for general health, symptom occurrence, or self-efficacy between patients in hospital and those in home care. Sixty-three percent of the patient had experienced aGVHD and 45% cGVHD. Twenty-seven patients developed aGVHD grade II-III (29% hospital care, 13% home care). One patient in the home-care group developed severe cCVHD. The occurrence of GVHD are presented in table 7.

Table 7. Occurence of aGVHD and cGVHD in hospital and home.

| | Total (*n*=117) | Hospital (*n*=78) | Home (*n*=39) | *p*-value |
|---|---|---|---|---|
| aGVHD, *n* (%) | | | | 0.063* |
| None | 43 (37) | 28 (36) | 15 (39) | |
| Grade I | 47 (40) | 28 (36) | 19 (49) | |
| Grade II | 23 (20) | 20 (26) | 3 (8) | |
| Grade III | 4 (3) | 2 (3) | 2 (5) | |
| Grade IV | 0 (0) | 0 (0) | 0 (0) | |
| cGVHD, *n* (%) | | | | 0.367 |
| Mild | 44(38) | 29(37) | 15(39) | |
| Moderate | 7(6) | 6(8) | 1(3) | |
| Severe | 1(1) | 0(0) | 1(3) | |

*acute GVHD of grades 0-I vs. grades II-III.

The majority of patients in both hospital care (77%) and home care (78%) rated their general health as 'good'. A median of 14 symptoms were reported by patients in both hospital (range 0-36) and home care (range 1-29). The five symptoms reported most frequently by patients in hospital care were tiredness (82%), impaired fitness (68%), loss of energy (67%), lack of sexual interest (59%), and difficulty in remembering (57%): for patients in home care were tiredness (68%), impaired fitness (58%), lack of sexual interest (58%), dissatisfied with body (57%) and loss of energy (55%) (table 8). Eighteen percent of the patients in hospital care and in home care were classified as cases of anxiety; while 12% of patients in hospital care and 18 % in home care were classified as cases of depression. Patients in both groups reported a high degree of self-efficacy, with a median score of 75 out of 100.

Table 8. The symptoms most reported by patients in hospital and home care.

| **Hospital care *n*=78** | **n** | **(%)** | **Home care *n*=39** | **n** | **(%)** |
|---|---|---|---|---|---|
| Tiredness | 62 | (82) | Tiredness | 25 | (68) |
| Impaired fitness | 52 | (68) | Impaired fitness | 22 | (58) |
| Loss of energy | 51 | (67) | Lack of sexual interest | 22 | (58) |
| Lack of sexual interest | 46 | (59) | Dissatisfied with body | 22 | (57) |
| Difficulty in remembering | 43 | (57) | Loss of energy | 21 | (55) |
| Mouth dryness* | 43 | (55) | Feeling less attractive | 20 | (52) |
| Body weakness | 40 | (53) | Difficulty in remembering | 18 | (47) |
| Sore in back, neck and shoulder | 39 | (51) | Difficulty to concentrate | 17 | (45) |
| Dissatisfied with body | 39 | (50) | Stomach flatulence/distension | 16 | (42) |
| Sleeping disturbances | 38 | (50) | Sleeping disturbances | 16 | (42) |
| Difficulty to concentrate | 36 | (47) | Fragile mucous membrane of genitals | 16 | (42) |
| Feeling less attractive | 36 | (46) | Sensitive to infections | 16 | (42) |
| Skin disorders | 35 | (46) | Body weakness | 15 | (40) |
| Stomach flatulence/distension | 34 | (44) | Difficulty in seeing | 15 | (40) |
| Joint problems | 32 | (42) | Mouth dryness* | 14 | (36) |

*Statistically significant difference between hospital and home care post-HSCT; dry mouth 0.05 (hospital care)

Factors associated with general health and symptom occurrence were analyzed in a multivariate logistic regression analysis on the study sample (*n*=117). The analysis showed that poor general health was associated with receiving a cord-blood HSCT (OR 19.1, CI 1.42-258.0, *p*=0.025), acute GVHD (OR 4.55, CI 1.19-17.4, *p*=0.025), and a low self-efficacy at follow-up (OR 0.95, CI 0.92-0.98, *p*=0.002). A high symptom occurrence ( >15 current symptoms) was associated with being female (OR 2.83, CI 1.17-6.87, *p*=0.02), acute GVHD, (OR 4.09, CI 1.51-11.0, *p*=0.005) and a low self-efficacy at follow-up (OR 0.95, CI .0.92-0.98, *p*<0.001).

## 7.3 FAMILY MEMBERS' EXPERIENCES

Study IV

From the in-depth interviews with the family members about their life situation and experiences of care, the latent content analysis identified one main category, *Being me and being us in an uncertain time* and five generic categories *To receive the information I need, To meet a caring organization, To be in different care settings, To be a family member,* and *To have a caring relationship*.

*To receive the information I need*

*To receive the information I need* was important during the HSCT trajectory. In relation to the HSCT process the first meeting with the physician and the home care nurse was important as a means to receive information about HSCT, the care setting, and the future. Positive factors related to information were identified (information with reassurance and hope, information sheet, and honest information). Information concerning survival rates was thought to be too negative, but it was also seen as something positive that gave hope for the future. Information was sometimes overly generalized and a need for more individualized information in relation to their own life situation and to the patient's health was sought. The Internet was also a source of information and served to confirm the information given by the health care team. Trying to find information was described as time-consuming and sometimes frustrating.

*To meet a caring organization*

HSCT treatment involves meeting the health care team over a long period in the hospital or at home and in the outpatient clinic. Family members reported experiencing good support. Participants described the health care team's professional competence. The high quality of care made the participants feel confident in both the staff and HSCT. To experience the enthusiasm of the team working in the transplantation center was one part of personal characteristics that was expressed to be unique for this center. The transplantation center and the team working there were considered "a living organism with an inspiration". Many felt that the health care team was there for them and was genuinely interested in them as persons and not only as family members. This special connection served as a firm base for the relationship.

*To be in different care settings*

The majority of family members had experiences from home care. Decisions about home care were discussed within the family; for some, the patient had the final "decision". Preparation for home care involved cleaning, storing potted plants, checking the temperature of tap water, and planning the care of pets. Sometimes a special room was prepared for the patient to spend most of his or her time. The home care nurse controlled the housing standards and went through the specific guidelines on matters of hygiene and isolation. Some family members questioned whether they could manage in the event the patient became ill at home. Positive factors with homecare were identified: freedom, being able to live a normal life, the environment at home strengthened their partner and for their own part, and they did not have any pressure to travel to the hospital on a daily basis. Being safe at home was related

to the support system, mainly from the home care nurse and the close distance from the hospital. A negative aspect of home care was identified: shortage of staff some patients had to stay or visit the hospital not for medical reason. A few patients continued to stay in the hospital because of severe side effects. Some of the patients in home care were re-admitted due to neutropenic fever, infection, or pain. However, this was expected and as soon it was medically safe, the patients returned to their home. A negative aspect of being in hospital was the lack of a supportive environment. However, family members were always welcome to stay with the patient around the clock.

Family members discussed how it was to live with the specific guidelines at home and in the hospital. All family members in home care reported the importance of following the guidelines, but they also pointed out that it was sometimes difficult to strictly follow them. Families with younger children described the children as a risk factor for infection. Children in kindergarten/daycare had to stay at home during the isolation period. However, living under isolation had little effect on the family members because they knew that this was for a limited time. Isolation, the increased risk of infection for the patients, and their health status were reasons for a reduced social life. All family members described taking an active part in supporting the patient, regardless of the care setting. However, greater family support occurred in home care. Family members in the hospital setting had a more passive role and thus tended to concentrate on being a good companion. The family members in home care took care of the household, prepared food, cleaned, and checked the well-being of the patient. However, the family members were well aware not to be directly involved in any of the health care duties. On the other hand, some family members described situations involving the complex assessment of the patient´s health.

*To be a family member*

My approach to HSCT and to the patient is individual based. Many of the family members allowed the patient be in charge and adjusted their life in relation to the patient's health. This approach was seen as an effective way to manage the current situation. The need for one's personal time was considered important (e.g., running tour, writing, and having routines). Support from friends, neighbors, and work colleagues was essential successfully manage the HSCT treatment. Meeting other family members with the same or similar experiences was an unexpected source of support. Altogether, this was the family members' entire support system. The majority of the family members felt a strong hope for cure. To live during the HSCT trajectory led living a life in the here and now. When interviewed, some family members had re-valued their life. Family members with children also expressed the effects of

HSCT on the children and the importance of involving them in the HSCT process with respect to their own circumstances. Being able to work was a positive quality of their life and contact with their work was expressed as a "lifeline" and an indication of a normal life. The majority of the participants had a flexible work arrangement, i.e. by agreement with their employer, they could decide when and where to work.

*To have a caring relationship*

The relationship often changed between family members, mostly in a positive way, with many indications of a stronger relationship and equal responsibility. In contrast, few expressed their relationship as a "care relationship". Issues of when "we" will return to the normal relationship that they had before the HSCT were raised. The majority of the family members had an intimate basis, which was acquired through years being together. Many of the family members referred to using the pronoun "we" (we are ill and we manage the HSCT) rather than "I". Because the patient´s health often involved rapid and uncertain changes, the family members were physically affected and they themselves showed several disturbing symptoms (e.g., heart rush, skin rash and gastric problems). The uncertain outcome for the patient led to worries and anxiety at different stages. Positive factors such as good financing and the right time in life to be ill were considered an advantage managing HSCT. However, because of a concern about the long recovery period, the many restrictions in their life, and that the health of the patients often changed, all made it difficult to plan for the future (both short term -and long term). Feelings of uncertainty about the overall outcomes of the HSCT were expressed by all of the participants.

# 8 DISCUSSION OF FINDINGS

The overall aim of this thesis was to describe patients and family members' life situation after HSCT as well their experiences from two different care setting. Data regarding patient reported experiences- and outcomes as well as family member's experiences after HSCT were collected. The findings (study I-IV) are discussed in terms of their combined contribution to the following three themes: Being safe in different care settings, balancing the uncertainty in transition to a new life and experiences of affected health and symptom occurrence.

## 8.1 BEING SAFE IN DIFFERENT CARE SETTINGS

According to Maslow [109], a basic human need is to feel safe. This need to feel safe becomes even more important during illness and HSCT treatment, which can be lifesaving but at the same time be life threatening. The present findings showed that irrespective of which of the two care setting (hospital or home care), the patients expressed a feeling of being safe (I, II). Furthermore, the majority of the patients were highly satisfied with the care and support they received by the staff during the neutropenic phase. However, patients in home care (I) were found to be more satisfied with care than patients in hospital care, thus the clinical significance can be discussed. Different factors were observed that were related to the feeling being safe: the care routines, receiving continuously updated information and the competence (I, II) of the health care professionals. Competence has been reported to be a blessing, as a security, and as a guarantee of a positive outcome.[110] In the context of home care, to feel safe was also related to the daily meetings (II, IV) with the nurse at home and the possibility of having contact around the clock with the transplantation center. Feeling secure at home has earlier also been linked to knowing that the health care team will support the family caregiver. [111]

Support from the health care professionals (I, II, IV), to receive adequate symptom management with many alternatives (II), and support encouragement (I, II, IV) were others factors associated with feeling safe. Nurses have previously stated that providing patients positive feedback is essential.[110,112] The staff members' different personalities (I, II, IV) generated positive meetings with patients and family members. Further, patients and family members felt the health care team enjoyed working at the transplantation center (II, IV) which exemplified the description of the center as *"the living organism with inspiration"*. Altogether, it supports that at the transplantation center, different professionals with specified competence (and showing acts of confidence) within the health care team are needed and that this is a key factor underlying why patients and family members felt safe.

Patients (I) acknowledged the importance and experiences of a climate that encourages discussion, information on a continuous basis to be able to participate in the care given (II). The information sheet (II, IV) was also viewed as an important source of information. Many patients took an active part in understanding their treatment and prognosis. This observation is consistent with earlier finding that well-informed patients are more likely to adhere to treatment recommendations that are essential for outcome and safety.[113] It is also in accordance to the Patient Act (SFS:2014:821)[114] in Sweden, which states and strengthens the importance of the patient's right to receive information based on the patient's own needs, and actively participate in the own care. However, present findings (II, IV) identified areas in need of improvement, such as information about restrictions and how to follow these areas in relation to the patient's health status. Family members also highlighted a need to receive information on their own. Thus, an individual care plan that comprises both short- and long term goals as suggested by Johansson and co-authors [115] with personalized treatment is supported by the current findings.

Person-centered care is driven by the patient's needs and preferences. Such care has been shown to improve patient satisfaction, participation, and safety. [116,117] The HSCT, however, is delivered within a tightly structured protocol aimed for maximum treatment effectiveness and survival, which in combination with medical risks, may limit the patient's possibility to express personal preferences regarding treatment. Many participants (II) stated that HSCT is a complex procedure but that they had complete trust in the health care team to make the right decisions, probably because they felt the health care team could be counted on to be skilled, professional, competent, and responsive. Still, the current study was able to identified home care (I) as person-centered care; in hospital care, person-centered cares was experienced as variation among the staff members and sometimes the participants had the impression that the caring routines by itself was most important (I, II). Therefore, areas in need of improvement in the hospital daily routines are to identify situations that could be more personalized and to allow the patients to exercise a greater degree of control over their health care.

As not earlier scientifically reported, a key question raised in the present thesis, "What does it mean for the patient and the family member to be at home in the early phase of the acute post HSCT phase?" The home plays a central part in the lives of most people. As described, home is a place with security, a place that allows independence and an arena for one's own routines .[118,119] Our findings indicate that these elements can be maintained with home care. Roush and Cox [120] asserted that the meaning and function of home can be described as a familiar place for comfort, as a center for everyday experience, time and social life, and as a protector

of privacy, identity, and safety. Patients with home care need a family member or friend to stay with them during the neutropenic phase. Surprisingly, and in contrast with an earlier report, none of the participants (II) report that absence of a family caregiver was the reason for eligible patients not be able to stay at home.[121] The current work identified to give the patients a sense of "a profound feeling of freedom" (I, II) and some patients also stated that being at home might have helped them to recover more quickly from the HSCT (I, II). Positive advantages with home care were identified: more natural eating habits, an increased integrated physical activity at home, and the general pleasantness of the home environment. To be with the family was seen as essential, where the family "made it almost possible to live a normal life, even with many side effects and restrictions". A shortage of nursing staff members was noted (II, IV) and reported to hinder the possibility of patients being able to stay at home all time (e.g., patients needed to visit hospital but not for acute medical reasons). This observation underlines the need for a flexible organization with sufficient available medical personnel to utilize the full benefit of home care in the early phase of the acute post HSCT phase. An important issue to raise is the previous findings showing that family members are often isolated during the HSCT, which leads to the exclusion of social networks and a reduced social life. [92,122,123] This finding was not supported in the present study (IV), perhaps because the majority of the family members were at home and thus experienced a relative normal life at home. The limited time in isolation and the positive effect earlier of being at home with a normal life as possible [118] are plausible reasons for this discrepancy with other studies which manly have involved hospital care.

Thus, various factors related to the arrangement of care were shown to influence the feeling of being safe, regardless of care setting. Comparison with other centers[24-27,124,125] is difficult because of large variations in how home care and outpatient care are performed, as well as the absence of patients reported experiences of care. But the current work suggests the care at Karolinska University Hospital provides good support and encouragement so the patient and family members could feel safe and secure knowing that they would be given the best care. Still, areas of improvements were identified, such as the importance of person needed care which may further facilitate the process of feeling safe. In this aspect home care is important since it was identified to be beneficial to ensure a person- centred care. Although, experience with home care in the long-time perspective and its effect on recovery is not well understood.

## 8.2 BALANCING THE UNCERTAINTY IN TRANSITION TO A NEW LIFE

Facing a life-threatening illness and undergoing HSCT means a long recovery period for the patients. The uncertain future after HSCT appeared as a central experience (I, II, IV). These

findings can be related to the fact that the participants were recovering from HCST in the early recovery phase, analyzed to be in an ongoing transition. Being in a state of transition often implies a certain degree of uncertainty. [39] Participants used different strategies to handle this situation. These strategies have been identified to affect transition [39], strong faith (I, II, IV) in HSCT, being positive (I), having hope (I, II, IV) to live in the present (I, II, IV) and the support of family members (I, II). Hope has been regarded as a strategy patients apply during HSCT. [126] Even though the patients (I, II) were in the early recovery phase of HSCT, another observation was that some patients noted that values about what was important in life changed towards a new life situation. However, although current knowledge of this type of change often takes a longer time [40], the sense of changed reference values helped to balance the strong impact (I, II) of HSCT on their new life situation, especially the side effects, including the realization that these would be present for a long time. Our findings indicated many of the restrictions were major obstacles to having a normal life, and the patients felt that they needed more individualized advice, i.e. advice specifically tailored to the individual. Participants (I, II,) also acknowledged the importance of information as a strategy to handle this situation, i.e. to be able to understand the whole process in relation to their own needs in order to be able to participate in the care process. This position is in accordance with previous study showing assistance from health care professionals in helping patients seek and identify realistic goals facilitated their integration back into normal life. [115] However, we found no differences between home care and hospital care regarding the patients' degree of uncertainty.

In the early post-HSCT recovery phase, feelings of uncertainty have also been reported by family members.[90,127] In one study family members felt that HSCT is like "riding a roller-coaster in the dark". [122] This observation was also noted in the current thesis and reported to be related to the unpredictable health of the patient and the risk of rapidly changing health conditions (IV). A way to reduced uncertainty is to create a new norm in which control and confidence are increased.[128] This endeavor would suggest a less uncertainty with home care but this could not be identified. A plausible reason could be to medical responsibility as exemplified by the following question often raised by family members (IV) within the context of home care, "Will I be able to manage my partner at home?" To manage their uncertainty the family members (IV) searched for information on their own, adjusted their life according to the patient's health status, arranged a sufficient amount of time for themselves, adopted routines to daily life, and tried to live in the present. Sabo [90] emphasized the importance of giving family members reassuring information and hope. The need appears to be highest in the pre-transplantation phase and there may be potential for further

improvement within this phase. In this thesis family members (IV) stated that true and individualized information is essential in the pre-transplantation phase.

Uncertainty has been reported to have a great impact on caregiver burden. [129] The stress of providing care has been shown to be manifested as feelings of loneliness, isolation, and fearfulness [130] , as well as having difficulty to make short-or long-term plans for the future. [90,122] Such circumstances can create poorer life satisfaction for family members.[129] Importantly, Bevans et al. [131] showed that caregivers participating in a problem-solving form of education during the HSCT period increased their self-efficacy and reduced symptom distress. However, only a few studies have examined the effect of interventions (e.g., education, psychosocial support, and self-care for the family caregivers of HSCT recipients) on an individual's life situation.[89]

Thus, the current thesis underlines earlier reports about the uncertainty that exists in both patients and family members. Different strategies to balance the uncertainty were used. Somewhat surprisingly, no differences in this aspect could be identified between the two care settings, home vs. hospital care. Interventions to help patient and family members structure the uncertainty should be further developed and tested.

## 8.3 EXPERIENCES OF AFFECTED HEALTH AND SYMPTOM OCCURRENCE

In the current thesis, numerous symptoms were reported in the early post HSCT phase (I, II), as well in the long term (III). In the early HSCT phase period symptoms were reported (I,II) such as nausea, mucositis, pain, infections. [19] The majority of patients (III) had good self-reported general health (hospital care 77%, home care 78%) in median five (range1-11) years post HSCT. This finding concurs with previous longitudinal studies in which more than 60% of the patients reported good to excellent QoL 1-4 years after HSCT [73,132], some patients have even reported improved health. [70] Patients in both the hospital and home care group reported a median of 14 current symptoms that impacted on general health after a median of five years following HSCT. The highly rated self-reported health in relation to relative high number of symptoms represents a discrepancy. Speculatively, this might be explained by a response shift, i.e. the participants had a changed view of life, one in which they became to accept a lower level of functioning. Such a re-appraisal of life values has been reported in the literature after cancer diagnosis and intensive treatment.[74,75] Common symptoms observed in both care groups were; fatigue including tiredness, impaired fitness, loss of energy and lack of sexual interest. Current findings are in accordance with are earlier reported symptoms in long-time survivors.[70,133] In the present thesis the multivariate analysis identified factors not

directly related to a caring context to be associated with poorer general health (e.g., acute GVHD, low self-efficacy, and stem cells from CB). In general, high symptom occurrence was associated with acute GVHD, being female and low self-efficacy. An interesting aspect was that gender was identified to be a predictor of poor general health, i.e. female patients had a significantly higher number of symptoms. This finding, however, is in accordance with a previous report on the early post-HSCT recovery. [134] Further, high self-efficacy was associated with better general health and lower symptom occurrence. This result is also in line with other studies in which self-efficacy was shown to influence the QoL of HSCT patients [135], as well as mixed groups of cancer patients. [136,137] In theory, self-efficacy is not a static characteristic and can be altered by behavior, by internal personal (cognitive, affective, and biological events), and by external environment. [138] To identify self-efficacy and introduce targeted preventive support in patients with a low degree of self-efficacy early in the course of HSCT may be important preventing long-term effects on health and symptom occurrence. [139] Patients should be encouraged to take an active role in treatment by being well informed about essential issues. Such an active role will probably help the patient to perform self-care during the HSCT trajectory.

Patients with home care have been shown to have fewer days with fever, less use of parenteral nutrition, reduced incidences of moderate to severe acute GVHD, a lower rate of transplant-related mortality, and improved survival compared with matched patients treated in hospital during the neutropenic phase after HSCT. [28,140] The higher incidence of acute GVHD in a hospital setting is speculated to be related to environmental factors, for instance in hospital environment patients are more likely to be exposed to various infectious agents than in other environments (e.g., the home).[141] The same is for an alien environment that acts as a stress-related trigger of acute GVHD through various inflammatory cytokines [142] and activation of T-cells. [143] Patients at home also have shown to have a better oral nutrition [36] which has been shown to be correlated to lower severity of acute GVHD.[144] Thus, our idea was that a lower prevalence of acute GVHD particularly in patients treated at home would benefit general health and symptom occurrence in the long term. Contrary to our expectations, reported short-term benefits with home care [28] did not appear to persist in the longtime perspective (III). The multivariate analysis that included all patients (III) revealed that acute GVHD was an independent risk factor for poor general health and high symptom occurrence at follow-up. Contrary to previous studies from our center, only a trend of less severe acute GVHD (grades II-III) was observed in the home care group (hospital care 29% , home care 13% $p$=0.063). In previous studies, chronic GVHD has been shown to predict patients' QoL [145], but as with acute GVHD, no differences were observed between the two

care groups. Nor did we observe an association between chronic GVHD and general health in our regression analysis. Concerning the latter finding, a plausible explanation could be the fact that very few patients developed severe chronic GVHD.

Family members and patients each contribute to the QoL of the other. During the acute transplantation phase, a high degree of distress has been find to occur not only in patients but also in family members. [88] This observation was also noted in this thesis, where the family members (IV) described how their health was affected and how there was an increase in distress symptoms. The negative effects on family members can be explained by the notion of protective buffering, which refers to a social support phenomenon in which one member in the relationship attempts to minimize the stress on the other in certain situations. Langer showed that family caregivers buffered the patients more than the patients buffered their family caregiver, which led to poorer mental health for the family caregiver.[146] Finally, family caregivers with experiences of combined care settings have shown less anger, anxiety and fatigue.[147]

Thus, general good health was reported in the long time term: however, there were with many ongoing symptoms during the trajectory. A good self-rated health in combination with a high number of symptoms indicates a response shift, which refers to the phenomenon that the meaning of a person's self-evaluation changes over time. [75] The patient's health status affected family members negatively (e.g., they exhibited more signs of stress and anxiety). Finally contrary to our hypothesis no differences were found between the two care settings, home vs. hospital care. Acute GVHD was an independent risk factor for poor general health and high symptom occurrence at follow-up but in contrast to previous studies from CAST, only a trend of less severe acute GVHD was observed in the home care group.

# 9 METHODOLOGICAL CONSIDERATIONS

The overall aim of this thesis was to describe patients' and family members' life situation after HSCT as well their experiences from two different care setting. To answer the various research questions different methods were used, qualitative (I, II, IV) and quantitative (I, III). Such an approach strengthens the results of this thesis. However, some methodological limitations in each study must be addressed.

Study I

The major strength was the use of qualitative and quantitative methods to capture the experience of care and support. However, the use of SAUC-questionnaire can be questioned in that it has not been psychometrically tested and has never been applied in a HSCT setting. These issues are reflected in the findings in which Cronbach's alpha levels were >0.7. [102] The SAUC instrument needs to be further tested to capture which questions do not measure the experiences of support. Further, it is difficult to compare the result with other PREM-questionnaires used in the oncology setting.[80,81] Finally, the results are based on a relatively small sample of patients (*n*=22). A strength may be the demographic and diagnostic homogeneity of the two study groups.

Study II

Strengths of the study were the variations in patients' age, gender, care setting, time since HSCT, and medical and socioeconomic characteristics. The transferability of the findings is probably influenced by external factors including differences in care between hospitals or in the context of health care. Yet, because it concerned fundamental considerations for the patients, the results of this study may be applicable to HSCT patients in other settings. Different categories and codes might have come to light if the participants were from more ethnically diverse populations had participated. The credibility of the study may be increased by making interpretation of data more visible to the reader trough incorporation of quotations from the participants' narratives.

Study III

Study III is one of the first studies to focus on long-term effects of treatment at home after HSCT. There were no significant differences in demographic or clinical characteristics between the participants in the two care groups. A relative high response rate was obtained (70%). This study had a rather small sample size on survivors of HSCT and a cross-sectional design was employed. It might therefore be difficult to make causal inferences because it

deals only with survivors and measures data at a single point in time. A longitudinal prospective design may have been better to determine when a positive effect of home care decreases. The present questionnaires have been used in previous studies and the measures achieved acceptable Cronbach's alpha levels for reliability. In this study, a single global question of overall QoL was used as a dependent variable. The use of single-item or multiple-item regarding QoL can be discussed. In this study the research questions required a global impression of health, as well the use as a dependent variable, a single item has been argued to be sufficient.[148,149]

Study IV

The sample in this study of family members was selected by the patients (II); however there were additional persons labeled as family members in the sphere of the patients who did not participate in the study. This fact raises questions about family members who were not asked to participate and whether different result might have emerged. On the other hand, one of the inclusion criteria was to have experiences from the patient's care setting because the aim was to gain more knowledge about the most responsible family members. The inability to recruit family members from culturally and ethnographically diverse backgrounds may have adversely influenced the results. Include culturally diverse groups might have been helpful in understanding the caregiving experiences and highlights if specific resources of support were needed. A strength of our study was the equal gender distribution of our sample.

# 10 SUMMARY AND CONCLUSIONS

Numerous factors (e.g., care routines, information, the competence and skills and support from the health care professionals) related to the arrangement of care were shown to be important elements that contribute to feeling safe. Care setting did not affect this feeling. Regardless of the care setting, patients expressed high satisfaction and felt safe with the care and support they received during the acute post-transplantation phase and to be at home had some positive advantages in feeling safe.

Both patient and family members expressed the uncertainty associated with the HSCT. Different strategies (to have faith, being positive, having hope and to live in the present) used to balance the uncertainty.

A high incidence of symptoms was reported in both groups after a median five years following HSCT. Poor general health was associated with acute GVHD, low self-efficacy and CB stem cells. Moreover, a high degree of symptom occurrence was associated with acute GVHD, being female, and low self-efficacy. No long-term differences in general health, symptom occurrence, and self-efficacy between patients who receive hospital care and those with home care were observed.

Based on the present findings, home care can be consider to be a valid care option for patients who consider this treatment choice during the early phase of the neutropenic phase. However, the need for an individualized care plan with personalized treatment choice during the HSCT trajectory has been highlighted. When a person in a family is treated with HSCT, it will affect the whole family. Furthermore, the family is a main source of support for the patient. Keeping this in mind, it is important to identify symptom distress among the family members and recommend appropriate support.

# 11 FUTURE STUDIES

Findings from this thesis have raised new research questions for future research. Research could focus on following areas.

- Longitudinal studies to investigate the support needs for family members during the HSCT trajectory.

- Identifying and testing interventions to reduce the level of uncertainty among family members.

- Identify characteristics within the health care professionals and organization as caring.

# 12 SVENSK SAMMANFATTNING (SUMMARY IN SWEDISH)

Allogen stamcellstransplantation (HSCT) är en intensiv behandlingsform som används framför allt vid vissa elakartade blodsjukdomar. Behandling innebär att blodbildande stamceller från en annan person (allogen) ges till patienten. Intensiv cytostatika och ibland strålbehandling föregår stamcellstransplantationen med syfte att få bort alla cancerceller. Denna behandling kan ge upphov till biverkningar såsom infektioner, hud/slemhinnepåverkan, smärta och illamående. Patientens nya stamceller kan även reagera mot patientens egna vävnader, vilket benämns transplantat-mot-värdsjukdom (förkortas GVHD, graft versus host disease). Under det senaste decenniet har behandling och omhändertagandet av patienten utvecklats framförallt har behandlingen individanpassats.

Patienter som vårdas vid Centrum för allogen stamcellstransplantation vid Karolinska Universitetssjukhuset (CAST), Stockholm har under de senaste 15 åren haft valmöjligheten att bli vårdade i hemmet under den akuta transplantations fasen. Vilket innefattar tidsperioden 2-3 dagar till 2-3 veckor efter transplantation. Sjuksköterskor från CAST vårdar patienterna i hemmet, de bedömer patients hälsostatus samt stödjer och motiverar patienten i dennes egenvård av sjukdomssymptom. En daglig kontakt sker även med patientansvarig läkare gällande bedömning av hälsostatus. Vid problem som kräver sjukhusvård återvänder patienten till sjukhus, för att sedan åka hem när tillståndet har förbättrats. För att kunna bli vårdad i hemmet måste vissa förutsättningar vara uppfyllda: patienten måste ha en närstående som kan vara hos henne/honom dygnet runt, vattentemperatur i patientens hem måste vara minst 50 °C, inga husdjur får vara hemmet samt transport till sjukhuset får inte ta mer än två timmar. De som vårdas på sjukhuset är isolerade men uppmuntras att ha sällskap av närstående.

Syftet med aktuell avhandling var att beskriva livssituation för patienter och familjemedlemmar efter HSCT utifrån de upplevelser de har från att ha blivit vårdad under den intensiva behandlingsperioden i två olika vårdmiljöer, hemmet och på sjukhus. Data samlades in med hjälp av olika frågeformulär (studie **I, III**) samt genom intervjuer med patienter (**II**) och familjemedlemmar (**IV**). Totalt deltog 173 patienter (studie **I** *n*=41; studie **II** *n*=15; studie **III** *n*= 117) och 14 familjemedlemmar (studie **IV**). I delstudie **I** skattade patienter sin tillfredställelse med vården och stöd. Studien visade att oavsett hemvård eller sjukhusvård var patienterna tillfredställda, både med sin vård samt det stöd de fått under den akuta post transplantationsfasen. Oavsett vårdform beskrevs även en upplevelse av trygghet, empati och uppmuntran från personalen samt att kontinuerlig information som gavs under vårdtiden var av stor betydelse. I delstudie **II** intervjuades patienterna om sin livsituation

efter HSCT. Vid kvalitativ innehållsanalys framkom fyra kategorier: *Att var på ett tryggt ställe* vilket innebar att patienterna var trygga oavsett vårdform, men att kunna vara hemma innebar en större frihet och möjlighet att leva ett normalt liv tillsammans med familjen. I *Att ha ett stödjande nätverk* beskrevs betydelsen av personalens kompetens och personliga sätt att ge stöd men även betydelsen av att vara nära sin familj. I *Mitt sätt att ta kontroll* beskrevs olika faktorer att hantera situationen genom att söka information, ha hopp, dagliga rutiner och försöka leva i nuet. Slutligen i kategorin *Min osäkra väg tillbaka* beskrev patienterna upplevelsen av en oviss framtid och oro för återfall. Delstudie **III** var en tvärsnittstudie med patienter som genomgått en stamcelltransplantation mellan åren 1998-2008. Syftet var att jämföra hälsa, symptomförekomst och tilltro till sig själv med patienter som vårdas i hemmet eller på sjukhus. Båda grupperna skattade en god hälsa (77 % i hemvård och 78 % i sjukhusgruppen). Intressant var att oavsett hemvård eller sjukhusvård var det en hög förekomst av symtom (median 14 symptom; sjukhusgruppen 0-36 och hemvård 0-29). I denna studie fanns ingen skillnad mellan grupperna med avseende hälsa, symptomförekomst och tilltro till sig själv. I delstudie **IV** intervjuades närstående efter upplevelser av vård från hemvård eller sjukhusvård och om deras egen livssituation. I den kvalitativa innehållsanalysen framkom en huvudkategori *Vara jag och vara vi i en osäker tid* och fem kategorier. I *Att få den information jag behöver* lyftes betydelsen av ärlig och individuell information. I *Att möta en vårdande organisation* beskrevs att personalens kompetens gav hög tilltro till dem och transplantationen. I *Att vara i olika vårdmiljöer* identifierades positiva fördelar att vara hemma. I *Att vara en familjemedlem* beskrev närstående olika sätta att anpassa sig efter den sjuka familjemedlemmen samt även strategier som att ha egen tid och rutiner i det dagliga livet särskilt viktigt. I *Att ha en omsorgsfull relation* beskrevs en nära relation med den sjuka familjemedlemmen och att tillsammans gå igenom transplantationen. En osäkerhet om utgången av transplantationen identifierades hos alla närstående.

Den aktuella avhandlingen visar att en majoritet av patientern oavsett hemvård eller sjukhusvård skattade en hög hälsa trots att en hög symptomförekomst efter transplantationen. Ett antal faktorer identifierades, oavsett vårdform, ha betydelse för patienter och närstående känsla av trygghet, såsom vårdrutiner, att få information, vårdpersonalens kompetens och stöd. Både patienter och närstående uttryckte en osäkerhet om framtiden efter stamcellstransplantationen. Olika strategier identifierades för att balansera denna osäkerhet, såsom tilltro, vara positiv, ha hopp och leva i nuet.

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