

**HEART FAILURE**  
A Guide for Self-Care

Working life connection Oulu City Hospital, wards A3, B3 & H2

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Heart Failure is a very common heart disease among the Finnish population. Heart failure is a condition which untreated has a high mortality rate and it can lead to other conditions. Self-care plays an important role when treating heart failure. Changes in the diet and exercise can improve the condition of the patient significantly

The purpose of the project was summarized into three project questions which purpose was collect information about what is heart failure, how it is treated, the big role self-care plays when dealing with heart failure and how to practice it, the usual medical care that is used to treat HF and finally a clear informative patient's guide.

The data collected for the project is used in the patient's guide named Self-care Guide for heart failure which is oriented to patients that are recently being diagnosed with heart failure. The patient's guide was compiled as project for the Oulu City Hospital, wards A3, B3 and H2.

The guide produced in this study is directed to people who have just been diagnosed with heart failure. The guide contains information about the condition, self-monitoring, and the diet and the exercise regime that should be followed to increase the wellbeing of a heart failure patient. In addition, a brief introduction to the medication usually used and information about sexuality when dealing with people with heart failure are included in the guide.

Key words heart failure, self-care, guide.

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## 1 INTRODUCTION

Heart failure (HF) is one of the most common cardiovascular diseases in Finland and according to the Finnish institute for health and welfare (2020), about 27,000 people received special compensation for the treatment of heart failure in year 2018. The prevalence of heart failure increases with age; one in ten Finnish people over the age of 75 suffer from it, while it is rare in people under the age of 50 (Kettunen 2018). Sudden worsening of heart failure is one of the most common causes of hospitalization, resulting to the fact that costs of the care are high. Despite a good care the heart failure mortality rate is still high in Finland. (Sydäntutkimussäätiö 2020.) Thus, it can be assumed that self-care is an important part of the treatment of heart failure (Tarnanen, Lommi, Lassus & Merlaava 2018).

This thesis can be useful for healthcare professionals, because many Finns suffer from heart failure. Therefore, it is essential to be able to identify the disease and how those who suffer from heart failure could influence their own condition at home and what is good to pay attention to. Due to the disease the importance of medication, nutrition, and exercise increase and affects to the patient's relationships and sexuality are evident. All these issues are closely related to the daily life of a patient with heart failure and are therefore relevant to the patient's self-care. Successful treatment requires guidelines for lifestyle changes and diverse medication, as well as the patient's ability to apply these guidelines to their daily lives. (Lommi 2015.)

The purpose of this thesis project was to gather information about self-care of heart failure from the nurse's point of view and with that information to provide a written guide to the patients with recently diagnosed heart failure. Thesis commissioner is the Oulu City Hospital, wards A3, B3 and H2 which specialize in patients with acute illnesses including cardiovascular diseases. The wards also specialize in elderly patients. Service supervisors of the wards worked as the working life connection in this study. The goal was to increase awareness of out-patients with heart failure about the means of self-care by which they can

influence their own physical well-being through their own actions and thus increase the patient's motivation to care. The research questions of this thesis project are: What is heart failure and how does it affect a patient's life? How can a patient influence his or her own illness through self-care? How to prepare a clear and informative patient guide? The thesis project also provides a lot of information and skills on how nurses can guide the patient in future situations.

During the thesis project, the most important means of self-care for heart failure were investigated with the help of an evidence-based nursing literature review. Studies and literature sources are going to be used to build a theoretical foundation and to produce the content of the guide. The PubMed (United States National Library of Medicine), ScienceDirect, Cochrane Library and Terveysportti were selected as databases to be retrieved.

## 2 PURPOSE AND GOAL

The purpose of this thesis project was to gather information about self-care of heart failure from the nurse's point of view. With the information gathered a written guide which describes the most important means of self-care for to the patients with recently diagnosed heart failure was produced. The goal was to increase the awareness of out-patients about heart failure and about the means of self-care. Self-care allows patients to influence their own physical well-being through their own actions and thus increase the patients' motivation to care. The project also provides a lot of information and skills on how nurses can guide the patient in future situations.

The project questions are:

1. What is heart failure and how does it affect a patient's life?
2. How can a patient influence his or her own illness through self-care?
3. How to prepare a clear and informative patient guide?

### 3 SELF-CARE GUIDANCE FOR AN OUTPATIENT WITH HEART FAILURE

#### 3.1 Heart failure

In Finland, heart failure incidences occur in one to two percent of the total population and about 10% of 70-year-olds suffer from heart failure and the incidences will increase in the future due to the population aging. However, the treatment of diseases that cause heart failure have intensified, which prolongs the life expectancy of heart failure patients. (Sydämen vajaatoiminta 2017.)

A patient with heart failure suffers from a syndrome in which the pumping force of the heart is impaired. This causes the person to have insufficient blood circulation in the body. (Tarnanen et al. 2018.) However, heart failure should not be considered as an independent disease, but instead as a result of another disease that affects the circulatory system. The most common underlying diseases of heart failure are high blood pressure, coronary heart disease, and various heart valve defects. Symptoms suggestive of heart failure include abnormal heartbeat, tiredness, shortness of breath at rest or on exertion and fluid retention (swelling of the lower limbs and rapid weight gain). Symptoms are due to the inability of the heart to respond to the needs of the body's blood circulation and the accumulation of excess fluid in the periphery and lungs of the body. (Maijala, Ihanus, Kiema, Miettinen, & Ylönen 2018, 4.)

In heart failure, treatment is directed to the root cause or causes that have triggered the condition, such as the treatment of high blood pressure, myocardial ischemia, valvular disease, or arrhythmias. Heart failure is caused by either a decrease in the contraction force of the heart or a stiffening of the walls of the heart. (Lommi 2015.) Systolic insufficiency is impaired cardiac contraction. In diastolic insufficiency, the filling of the ventricle of the heart is made more difficult due to thickening or stiffening of the wall. In most heart failure cases, the ability of the left ventricle of the heart to contract is impaired. (Syväne 2018 a.)

Chronic heart failure refers the state in which the symptoms are more or less stable. Symptoms may be mild or severe (Tarnanen et al. 2018). Acute heart

failure is when a disease begins or worsens suddenly as a result of a heart event for example arrhythmia and heart attack (Piepoli et al. 2016). The most common symptom is shortness of breath which occurs even at rest or with little exertion. Gaining weight in a short period of time (> 2 kg in three days) suggests worsening of the heart failure and fluids accumulating in the body (Majjala et al. 2018, 8). This is a life-threatening medical condition which requires urgent assessment, treatment in a hospital, and guidance of self-care (Tarnanen et al. 2018).

To confirm the diagnosis of heart failure, laboratory tests and imaging studies such as electrocardiogram (ECG) and lung X-ray are taken from the patient. The most used tests in patients with suspected HF are the echocardiogram (Echo) and ECG. The echocardiogram provides information on wall thickness, valve function, chamber volumes, ventricular systolic and diastolic function and pulmonary hypertension. Also, the increased fluid in the pericardium is easily visible. The ECG shows the heart rhythm and electrical conduction, whether there is sinoatrial disease, atrioventricular (AV) block, or abnormal intraventricular conduction. Echocardiogram and electrocardiogram findings are important for decisions about treatment. Chest X-ray is not used as much anymore when diagnosing heart failure, but it may show oedema or pulmonary venous congestion in a patient with HF. (Piepoli et al. 2016.) Laboratory tests are usually also needed. Cardiac-secreted natriuretic peptide (BNP) tested by a blood test is almost always elevated in when the heart is diseased or the load on any chamber is increased (Kettunen 2018). In addition to basic laboratory tests (blood count, inflammatory values, and values affecting cardiac function), it is beneficial to measure thyroid-stimulating hormone (thyrotropin) as thyroid disease can mimic or worsen heart failure. Undiagnosed diabetes is common in patients with HF thus, blood glucose is also worth measuring. Liver enzymes may also be abnormal in HF. (Piepoli et al. 2016.)

The New York Heart Association functional classification (NYHA) is used to describe the severity of symptoms and physical activity intolerance, it can provide better understanding of the progression and prognosis of heart failure (table 1).



|           |  |
|-----------|--|
| Class I   | No limitation of physical activity. Ordinary physical activity does not cause undue breathlessness, fatigue, or palpitations.                                    |
| Class II  | Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in undue breathlessness, fatigue, or palpitations.           |
| Class III | Marked limitation of physical activity. Comfortable at rest, but less than ordinary physical activity results in undue breathlessness, fatigue, or palpitations. |
| Class IV  | Unable to carry on any physical activity without discomfort. Symptoms at rest can be present. If any physical activity is undertaken, discomfort is increased.   |

Table 1 NYHA classification (Zhang et al. 2018).

### 3.2 Self-care of heart failure

In chronic illness like heart failure self-care has showed to reduce the use of health care utilisation, one of the biggest components of self-care is the use of self-monitoring. Self-monitoring can be defined as the use of different tools; measurement of vital signs (blood pressure, heart rate), awareness of the symptoms (weight gain, dyspnea, orthopnea, edema), psychosocial well-being, data interpretation, self-adjustment of treatment, lifestyle, and medication implementation. (McBain, Shipley & Newman 2015; Sydämen vajaatoiminta 2017.) Self-care can be described as the capacity to cope with the psychosocial and clinical consequences with the lifestyle changes that the chronic illness requires, the goal is to control and reduce the symptoms of the disease or to prevent stages of disease deterioration that could lead to hospitalization (McBain, Shipley & Newman 2015; Maijala et al. 2018, 5).

It is important for the patients to recognize the symptoms of worsening heart failure, evaluate them and if the situation requires it, take action implementing a treatment strategy and evaluate the response (Sousa, Neves, Lobão & Gonçalves 2019, 51; Bui & Fonarow 2012). Individual medication should be followed and, if necessary, the dosage of diuretics should be adjusted according to the doctor's instructions according to weight fluctuations. (Sydämen vajaatoiminta 2017.) Weight should be measured regularly as the unexpected weight gain (> 2 kg in three days) is often associated with worsening heart failure and fluid retention. The daily weighing should be done under similar conditions (for example, in the morning with light clothing) and with the same scale. (Maijala et al. 2018, 8). Smoking and alcohol consumption should be avoided as they are common risk factor for heart disease. Exercise according to one's own strengths and conditions is highly recommended to maintain and improve fitness. Appropriate cardiac rehabilitation is possible and recommended. (Syväne 2018 b.) Successful implementation of self-care requires that the patient has sufficient knowledge and understanding of his or her own illness and the basics of its treatment. The goal of treatment is patient-oriented, individually planned and implemented treatment that takes into account and respects the patient's wishes, needs and preferences. (Sydämen vajaatoiminta 2017.)

### 3.3 Nutrition and diets

Heart failure causes the heart to work too hard. This can be affected by nutrition. A healthy diet can have a positive effect on the function of the heart. When the intake of sodium and fluids is too high, the liquids of the body may increase, causing a worsening of the HF (UCSF Health 2020). It is also important to take into consideration macronutrient nutrition and the intake of saturated fats which should be low (Barnard 2018). The diet is even more important when taking diuretics as it can cause electrolyte imbalance and vitamin deficiencies (Abshire et al. 2015). When the intake of fluids is too high it can cause a worsening of the heart failure (UCSF Health 2020). This is why in severe heart failure cases when it causes swelling it is recommended to limit the liquid intake to 1.5L – 2L.

However, patients that use diuretics need to remember to drink enough liquids to stay hydrated. (Maijala et al. 2018, 9; Käypä hoito-suositus 2017.)

When referring to heart health and nutrition, it is important to mention the appropriate use of alcohol. The effects of alcohol use are personal and the recommended dose can vary between patients. The recommended dose of alcohol also varies between women and men. For women the recommended use is one restaurant dose per day and for men it is up to two restaurant doses per day. However, the daily use of alcohol is not recommended. When mentioning a restaurant dose, it means that a drink contains 12 grams of absolute alcohol that can be a 0,33l beer or a 12cl wine. (Koivumäki & Hekkala 2018.) Alcohol use is limited because it collects fluid in the body and increases the rise in blood pressure and risk of arrhythmia. (Sydämen vajaatoiminta 2017). Also, alcohol contains a large amount of energy which can show up as an increase in weight which can worsen the condition of heart failure (Koivumäki & Hekkala 2018).

There is no need to follow a strict diet to eat in a healthy way and support the health of the heart (Gray 2020). It is important to provide all the essential nutrients the body needs which are carbohydrates, fats, proteins, water, vitamins and minerals (Abshire et al. 2015). To provide all these nutrients, it is recommended the consumptions of nutrient rich edibles and avoid food with a high content of calories and poor content of nutrients (Gray 2020). There are some diets that are heart-health friendly, like the DASH diet and the Mediterranean diet. The DASH diet was designed to lower blood pressure and the Mediterranean diet follows the diet on Mediterranean countries, with these diets it is easy to keep the healthy habits that can support heart's health, including the low consumption of sodium (Gray 2020). The sodium intake is usually restricted when dealing with heart failure. The maximum daily amount recommended is up to 5 grams. The dose can vary depending on how severe the HF is (Terveyskylä 2019). The amount of sodium also varies in different diets, in the DASH diets the amount recommended daily is 1500mg to 2300mg (National Heart, Lung and Blood Institute).

### 3.3.1 The DASH diet

The DASH diet also known as Dietary Approaches to Stop Hypertension was sponsored by the United States National Institutes of Health with the idea of lower blood pressure without the need of use drugs. The first research showed that the effect of the diet was so good that could be compared to the first choice medications to lower blood pressure, after that it has been proved that the DASH diet can reduce the risk of many other illnesses for example heart failure, stroke, diabetes. (Heller 2018.) The DASH plan is based in a flexible and balanced diet that helps achieve heart-healthy goals (National Heart, Lung and Blood Institute).

The DASH recommendations are the following:

- Vegetables, fruits and whole grains.
- Dairy (low-fat or fat-free), fish, beans, nuts, vegetable oils.
- Limit saturated fats
- Limit sugar-sweetened drinks and candy
- Foods rich in potassium, calcium, magnesium, fiber and protein.
- Limit sodium intake

(National Heart, Lung and Blood Institute).

The diet plan is easy to follow as it is composed by common foods and different food groups are included. The diet is based in daily serving that vary with the calorie (energy) needs of the individual following the diet (National Heart, Lung and Blood Institute). The number of calories the body needs is based in energy balance. The body has a stable energy balance when the amount of energy intake is the same as the energy expenditure (Hill, Wyatt & Peters 2012). There are three facts to take into consideration when calculating the calorie needs; gender, age and physical activity, based in these three factors the number of calories need can be calculated as it is showed in tables one and two (National Heart, Lung and Blood Institute).

**Daily Calorie Needs for Women**

| Age (years) | Calories Needed for Sedentary Activity Level | Calories Needed for Moderately Active Activity Level | Calories Needed for Active Activity Level |
|-------------|--|--|---|
| 19-30       | 2,000  | 2,000-2,200  | 2,400                                     |
| 31-50       | 1,800  | 2,000  | 2,200                                     |
| 51+         | 1,600  | 1,800  | 2,000-2,200                               |

Table 2 Daily Calorie Needs for Women (NIHLB)

**Daily Calorie Needs for Men**

| Age (years) | Calories Needed for Sedentary Activity Level | Calories Needed for Moderately Active Activity Level | Calories Needed for Active Activity Level |
|-------------|--|--|---|
| 19-30       | 2,400  | 2,600-2,800  | 3,000                                     |
| 31-50       | 2,200  | 2,400-2,600  | 2,800-3,000                               |
| 51+         | 2,000  | 2,200-2,400  | 2,400-2,800                               |

Table 3 Daily Calorie Needs for Men (NIHLB)

Once the number of calories is needed the number for servings ca be established, as it is showed in table number four:

**DASH Eating Plan—Number of Food Servings by Calorie Level**

| Food Group   | 1,200 Cal.         | 1,400 Cal.         | 1,600 Cal.         | 1,800 Cal.         | 2,000 Cal.         | 2,600 Cal.   | 3,100 Cal.   |
|--|--------------------|--------------------|--------------------|--------------------|--------------------|--------------|--------------|
| <b>Grains</b> <sup>a</sup>                             | 4-5                | 5-6                | 6                  | 6                  | 6-8                | 10-11        | 12-13        |
| <b>Vegetables</b>                                      | 3-4                | 3-4                | 3-4                | 4-5                | 4-5                | 5-6          | 6            |
| <b>Fruits</b>  | 3-4                | 4                  | 4                  | 4-5                | 4-5                | 5-6          | 6            |
| <b>Fat-free or low-fat dairy products</b> <sup>b</sup> | 2-3                | 2-3                | 2-3                | 2-3                | 2-3                | 3            | 3-4          |
| <b>Lean meats, poultry, and fish</b>                   | 3 or less          | 3-4 or less        | 3-4 or less        | 6 or less          | 6 or less          | 6 or less    | 6-9          |
| <b>Nuts, seeds, and legumes</b>                        | 3 per week         | 3 per week         | 3-4 per week       | 4 per week         | 4-5 per week       | 1            | 1            |
| <b>Fats and oils</b> <sup>c</sup>                      | 1                  | 1                  | 2                  | 2-3                | 2-3                | 3            | 4            |
| <b>Sweets and added sugars</b>                         | 3 or less per week | 3 or less per week | 3 or less per week | 5 or less per week | 5 or less per week | ≤2           | ≤2           |
| <b>Maximum sodium limit</b> <sup>d</sup>               | 2,300 mg/day       | 2,300 mg/day       | 2,300 mg/day       | 2,300 mg/day       | 2,300 mg/day       | 2,300 mg/day | 2,300 mg/day |

Table 4 DASH Eating Plan - Number of Food Servingd by Calorie Level (National Heart, Lung and Blood Institute).

The DASH eating plan is one key that can be used keep a heart-healthy lifestyle among another keys. (National Heart, Lung and Blood Institute.)

### 3.3.2 The Mediterranean diet

The Mediterranean diet plan is based in the food patterns from areas of the Mediterranean Sea for example Italy or Greece, research shows that the citizens from these countries are healthier and have less risk to develop many diseases in comparison with American citizens (Gunnars 2018). It is one of the most studied diets in relation with heart health and one with the most evidence-based in the prevention of cardiovascular diseases and other chronic diseases. The Mediterranean diet is compared to the interventions of some drugs when referring to the reduction of the risk to develop a cardiovascular disease (Widmer, Flammer, Lerman & Lerman 2015).

The Mediterranean eating plan is based in the consumption of fruits, vegetables fish, whole grains, legumes and nuts, olive oil. The diet is not based in calorie count plan like the DASH diet. One of the most noticeable facts of the diet is the high concentration of unsaturated fats in the fiber and protein sources, like the omega-3 fatty acids which one of the sources is fish. The recommended amount per week is two serving. (Widmer et al. 2015.)

Like many other diets where the goal is to improve heart health, the Mediterranean diet promotes the consumption of multiple pieces of fruits and vegetables per day. It is recommended the use of whole grains because of their high amount of fiber which the amount recommended is 25 to 30 grams per day, fiber reduces the risk of heart related diseases by lowering lipids (Widmer et al. 2015).

### 3.4 Exercise opportunities for heart failure patients

When treating heart failure exercise plays a big role. Exercise affects the condition in different phases, the past, present and future. It affects in the past as a prevention method of heart failure. Exercise provides benefits in primary

prevention. In the present as a part of the treatment, back in the past heart failure patients were recommended to not to do any efforts and rest. Nowadays it has been proofed the benefits of any kind of exercise in patients with heart failure, maintaining a sedentary lifestyle with heart failure can increase the risk of sudden death. In the future as a prediction, lack of exercise and sedentary lifestyle will be used a factor for heart failure prognostic. (Cattadori, Segurini, Picozzi, Padeletti & Anzà et al. 2018.)

Regular exercise reduces the symptoms of heart failure, lighten the workload of the heart by improving blood circulation, muscular metabolism and lung function and improve the physical performance and quality of life of a person with heart failure (Kutinlahti & Pellikka 2018). The New York Heart Association (NYHA) came up more than 80 years ago with a simple classification the limitation of exercise based on the severity of the disease:

- NYHA I: no limitations in physical activity.
- NYHA II: slight limitation in physical activity.
- NYHA III: marks a limitation due to fatigue and dyspnoea.
- NYHA IV: severe limitation.

(Alvarez, Hannawi, & Guha 2016.)

This is good for a quick classification, but it is not quite precise. New systems are used to determinate the limitation of physical activity. Different kinds of tests can be performed in a patient to determinate the limitations. A six-minute walk test, exercise electrocardiogram, stair climb, and cardiopulmonary exercise testing are some of the tests used. Exercise with heart failure is safe and it is associated with a decrease of the mortality and a decrease of hospitalizations. (Alvarez et al. 2016.)

The European Society of Cardiology states in their guideline that regular exercise is important for patients with heart failure to help improve the functional capacity and reduce the risks of hospitalisation (Emeline 2017). Nevertheless, getting

started into exercise requires a stable heart failure, it needs to be steady for at least a few weeks (Kutinlahti & Pellikka 2018).

There are contradictions to participate in exercise programmes listed in table number 5. There is not a universal training program for heart failure patients. The approach to exercise should be treated in an individual way and it is recommended that the first approach is done under supervision and in a centre-based program. (Emeline 2017.) It is very important for the patients to be motivated and find sports that will bring also joy, this will help with the perpetuation of exercising, in addition it is important to remember that the goals do not need to be reached right away, exercise is a process that need to be increased gradually (Kutinlahti & Pellikka 2018).

| Cardiac  | Non-cardiac                                  |
|--|--|
| Early after acute coronary syndrome  | Acute illness, fever                         |
| Untreated life-threatening arrhythmias                                       | Uncontrolled diabetes or thyroid             |
| Acute heart failure  | Severe COPD                                  |
| High degree atrioventricular block   | Cerebrovascular and musculoskeletal diseases |
| Acute myocarditis and pericarditis   |  |
| Symptomatic aortic stenosis  |  |
| Intracardial thrombus  |  |
| Progressive worsening of heart failure symptoms in previous 3-5 days         |  |
| Significant myocardial ischaemia or arrhythmia during low-intensity exercise |  |

Table 5 Contradictions for exercise training in HF (Emeline 2017).

Even that it has been mentioned that there is not a universal training program for approaching exercise (Emeline 2017) there are basic recommendations for heart failure patients approaching exercise. The endurance of the exercise is suggested to be at least 1.5 hours per week and divided in three or more times, for an instance 30min sessions 3 days a week. In addition to the one and a half



hours per week, once or twice a week 30 to 45 min of muscle strength exercise. It is recommended to warm-up before any work-out as well as relax and allow the heart rate and breathing to stabilize before stopping the exercising. (Kutinlahti & Pellikka 2018.) It is shown that exercise training with heart failure conditions leads to an increase on exercise tolerance that it is showed in the duration of the exercise as well as in the peak of VO<sub>2</sub> (maximal amount of oxygen the body can use). Usually, the improvement takes up to three weeks to show up, but it can continue increasing up to six months. (Piña et al. 2003.)

### 3.5 Medication for heart failure patients

Nurses play an important role by educating the patient regarding the pathophysiology of the heart failure disease process, and also in monitoring and guiding the patient regarding essential medications to optimize cardiac function and reduce morbidity and mortality. The long-term goal of treatment and management of heart failure is to decrease hospital readmissions and avoid aggravation. (Patterson & Felicilda-Reynaldo 2018.)

Different drug combinations are central to the pharmacotherapy of heart failure: diuretics, angiotensin converting enzyme inhibitors (ACE) or angiotensin receptor blockers (ARBs), and beta-blockers. The doses of medicine needed to treat heart failure are always individual and the dose is gradually increased. (Tarnanen et al. 2018.) Diuretics are added to the medication immediately if the patient has tissue swelling or shortness of breath (Patterson & Felicilda-Reynaldo 2018). Beta-blockers are part of a medication for a patient with heart failure, as they reduce heart rate, it is usually added at the same time or after the dose of the ACE inhibitor is increased to the target dose (Tarnanen et al. 2018). Mineralocorticoid receptor antagonists (MRA) are added to the medication of a patient with severe and moderate systolic insufficiency (Lommi et al. 2017).

A combination therapy of an angiotensin receptor blocker (ARB) and a neprilysin inhibitor can be introduced in a patient with systolic insufficiency. The combination can be used to replace an ACE inhibitor or ARB in patients who still have symptoms of heart failure after the doses have been added to the maximum

tolerated, in addition to them beta-blocker, MRA and diuretic therapy have been optimized as well. (Lommi et al. 2017; Sydämen vajaatoiminta 2017.)

ACE inhibitors improve prognosis in mild, moderate, severe and asymptomatic impairment. ACE inhibitors reduce the need for hospitalization regardless of the severity of heart failure and are used in all patients with left ventricular dysfunction. ACE inhibitors lighten the work of the heart by lowering peripheral resistance, reduction of blood volume and dilating blood vessels (Patterson & Felicilda-Reynaldo 2018, 385), as well as reducing the accumulation of fluid and sodium in the body (Lommi 2018). The effectiveness of the drug is improved with salt restriction and a diuretic. Treatment is primarily initiated with ACE inhibitors, but if they are not suitable due to side effects, ARBs may be used. Angiotensin receptor blockers improve prognosis in moderate to severe heart failure. Contraindications to treatment have previously been angioedema caused by an ACE inhibitor or an ARB, for example swelling of a small area of skin or mucous membrane and bilateral narrowing of the renal arteries. (Lommi 2018.)

Beta-blockers reduce death and the need for hospitalization when combined with ACE inhibitor and diuretic therapy (Patterson & Felicilda-Reynaldo 2018, 385). They protect the heart from the hyperactivity of sympathetic nervous system activation. Medication is initiated when heart failure is first balanced with other treatments. Beta-blockers improve prognosis in mild, moderate, and severe systolic heart failure. Patients with ischemic heart disease benefit most from beta-blockers. In the early stages of drug treatment, the symptoms of heart failure may temporarily increase due to the slow response to the drug. If beta-blockers have not provided an adequate response to optimize heart rate in atrial fibrillation, digital therapy may be used. This can also be used to relieve symptoms in patients with severe impairment (NYHA III-IV) as an adjunct to other optimal drug therapy. (Lommi 2018.) Mineralocorticoid receptor antagonists (MRA) reduce mortality and hospitalization in patients with systolic insufficiency regardless of the severity of the insufficiency as well as improve patient performance and left ventricular pumping capacity and remodeling. (Lommi et al. 2017.) A treatment using Digoxin is considered if the patient has atrial fibrillation with a very fast heart rate despite the use of other drug therapy. (Heikkilä, Ylönen & Miina 2019.)

A diuretic is the primary drug if a patient has pulmonary congestion and peripheral edema (Patterson & Felicilda-Reynaldo 2018, 385). Diuretic medication is individually tailored to the patient to minimize inconvenience to the fluid load while avoiding excessive dehydration and associated symptoms such as headache, dizziness, confusion, and fatigue. In steady state of HF, the dose of a diuretic should be the lowest by which fluid retention can be maintained. However, the need for a diuretic is affected by the amount of fluid the patient consumes and the possible loss of body fluids, for example as a result of diarrhea, vomiting or heavy sweating. Clinical evaluation of edema, and dyspnea, patient regular weight monitoring, will help with diuretic dosing as well as blood test monitoring of fluid values (creatinine, sodium and potassium) are important when choosing diuretic dosing. (Lommi 2018; Kettunen 2018.)

The combination therapy of an ARBs and a Neprilysin inhibitor is a new drug in heart failure. The medicine helps to pass sodium and water into the urine, which reduces the strain on the heart. It also lowers blood pressure by dilating blood vessels and protects against heart scarring associated with heart failure. (Kastarinen 2016.) It is used in place of ACE inhibitors or ARBs in patients who still have symptoms of heart failure even after the doses have been added to the maximum tolerated, in addition to them beta-blocker, MRA and diuretic therapy have been optimized as well. (Lommi et al. 2017; Sydämen vajaatoiminta 2017.) Ivabradine is used in patients with systolic insufficiency (NYHA II-IV) and whose heart is in a sinus rhythm with a heart rate over 75 beats per minute despite a beta-blocker therapy and ACE inhibitor therapy. Ivabradine slows down the sinus rhythm and thus relieves the resulting symptoms. (Lommi 2018.)

Certain medicines, including NSAIDs (ibuprofen, acetylsalicylic acid and ketoprofen) and an antidiabetes medicine (glitazone) are not recommended for people with heart failure. As well as some of the heart medicines, mainly calcium channel blockers (diltiazem, verapamil) and the short-acting nifedipine, are also non-recommended medicines. However, amlodipine or felodipine, may be used if associated illness is hypertension that is not adequately controlled after an ACE inhibitor or an ARB and beta-blocker. (Kettunen 2018; Tarnanen et al. 2018.)

### 3.6 The effect of heart failure on sexual activity

According to the New York Heart Association (NYHA) functional classification of heart failure patient's ability to participate in sexual activity depends on their affliction, being stabilized, and receiving optimal medical treatment (Jaarsma 2016). Sexual dysfunction is connected with frequently used medication in the treatment of heart failure for example cardiac glycosides, beta blockers and diuretics, as well as common heart failure symptoms such as fatigue, dyspnea and activity intolerance. When engaging in sexual activity, symptoms including shortness of breath, chest pain, palpitations and fatigue may emerge. (Baert et al. 2019.) Furthermore, psychological concerns, including fear, anxiety and depression can contribute to sexual problems in patients with HF. This creates a need for patients and their partners to receive counselling concerning a safe return to being sexually active and sexual functioning, as well as assessment, support and advice concerning with psychological problems. (Steinke et al. 2013.)

In the COACH study, of the 792 patients, almost fifty percent reported difficulties in sexual activity at 1 month after discharge. Patients who detect difficulties in sexual activity report a significant lower quality of life and overall well-being than those who do not. (Hoekstra, Jaarsma, Sanderman, van Veldhuisen & Lesman-Leegte 2012.) Fear of a cardiac event during sexual intercourse is a factor that interferes patients' ability enjoy and perform sex, although its risk of happening is relatively low; however, shortness of breath, a rapid or irregular heart rate, symptoms of chest pain, dizziness, insomnia after sexual activity, or fatigue the day after sexual activity should always be reported to the physician. (Steinke et al. 2013.)

When talking with the HF patient about sexual activity the counselling could include tolerance for sexual activity, and additionally positioning, being well rested before sexual activity, and how to manage symptoms which might include sexual activity such as shortness of breath. Sexual foreplay, for example, kissing, hugging or caressing, allows the patient and the partner to determine the patient's

sexual activity tolerance. However, sexual activity is not recommended patients with sudden worsening of HF symptoms or advanced (New York Heart Association class III or IV) HF, sexual activity should be postponed until their condition is optimally managed and/or stabilized. (Steinke et al. 2013.) Arousal always increases the heart rate and blood pressure, breathing also accelerates. This is all normal. (Jaarsma 2016.) The general guideline is to be well rested before sexual activity and without other stress factors such as a heavy meal or heavy alcohol consumption and also stopping to rest if having shortness of breath. (Steinke et al. 2013.) Regular and suitably strenuous exercise gives the best support for the recovery of sex life thus it reduces the risk of heart symptoms during sexual activity. (Liippola 2019.)

It is important for the patient to consider their own position during sexual activity, such as to avoid positions where there is pressure directly on the chest or upper limbs are overburdened. However, intimate life can be eased even with small changes. It is good idea to use pillows to support and soften the postures, for example a spoon position with upper body supported by pillows. It is important to remember that there are other ways to enjoy own sexuality with oneself and one's spouse other than intercourse. These means include intimacy, caressing, and various sex tools. (Liippola 2019.)

### 3.7 Patient guidance

The concept of patient guidance is an active and goal-oriented activity of the patient, which in this project means outpatients who are recently diagnosed with heart failure, and the health care staff. As patients must manage typical signs and symptoms that most of them are not even aware, they also have the challenge to manage several treatment routines. Therefore, it is important that patients with HF learn how to manage self-care in order to execute and maintain a healthy lifestyle and avoid hospitalization. In disease management nurses have an important role, particularly when educating patient about recognition of symptoms, treatment management and follow-up, as a lack of knowledge interferes with a failed self-care. Most of the patients have no routine how to

monitor their symptoms, which is why they are often uncertain how to interpret them and a delay for seeking care may occur. (Sousa et al. 2019, 51.)

The patient's have right to receive appropriate and up-to-date, evidence-based information about his or her illness, treatment and the factors that affect them according to the The Health Care Act 1326/2010. Thus, nursing staff are ethically obligated to implement patient guidance based on the patient's needs. Patient guidance is based on a interaction between the patient and the nursing staff, in which the patient actively participates in decision-making about themselves and increasingly takes responsibility for their own care. In addition, involving relatives in patient guidance enhances access to information. Patient guidance should be based on the patient's individual needs and utilize different methods, which require extensive knowledge from nursing staff. Patient guidance can increase the continuity and quality of care. (Tervo-Heikkinen, Saaranen, Miettinen & Vaajakoski 2018, 28.)

The goal of guidance for a patient with heart failure is to get the patient to commit to their own care which is successful only if the patient understands the cause, prognosis and reason why the symptoms occur. Thus, the guidance includes a plain language explanation on the signs and symptoms, underlying illness, self-care and treatment options as nutrition, physical activity, medication and its implementation. (Maijala et al. 2018, 4-6; Bui & Fonarow 2012.) In the initial phase, the patient needs written material to support oral guidance. As there are many things to guide, it would be desirable to give information in small batches, and if possible, divided into several guiding cycles. If needed, guidance is also given to relatives. (Maijala et al. 2018, 4-6.) Personal interaction cannot be replaced by written instructions, but often they serve as a necessary complement to self-care guidance. In order to be able to decide for themselves about their treatment, the patient needs information to support their decision. Patients not only want to know more about the diseases and their treatment, but they are also expected to have better self-care capabilities. (Heikkinen, Tiainen & Torkkola 2002, 7-8.)

### 3.8 Outpatient clients

An outpatient client receives the medical care or guided help in their own home and there is no need to spent long periods in a hospital ward or an institution. This includes rehabilitation and disease prevention, for example through health counseling. (St. George's University 2019.)

Outpatient care emphasizes a person's voluntary ability to influence the organization of services and housing arrangements. A service and care plan is usually prepared for the regular services provided to the person in outpatient care at home and the related support services. According to a decree of the Ministry of Social Affairs and Health, when a municipality arranges services, outpatient care is when a person receives day or night care arranged by a social or health care institution at home. Also, when patient is in home care or is at home and receives care provided by special care or has a caregiver. Between periods of institutional care he or she is considered to be in outpatient care. (Kela 2015, 4.)

In patients with heart failure, service management in outpatient care and monitoring system (education, home visits, telephone monitoring) reduces mortality and hospital stays. The key elements of service management in the above studies were, ducational interventions, which usually started before discharge from hospital, home visits, planned and scheduled telephone monitoring, and the possibility to contact the nurse by telephone as required. In addition, self-care guidance in matters related to exercise, nutrition, fluid and salt restrictions, weight monitoring, among other things. (Sydämen vajaatoiminta 2017.)

## 4 METHOD OF IMPLEMENTATION OF THE THESIS PROJECT

### 4.1 Practice-based thesis

In a practice-based thesis, the student makes an output, such as a brochure, guide, model, orientation folder or process description (Salonen 2013, 5-6), with the aim of changing a state of affairs or activity (Salonen, Eloranta, Hautala & Kinos 2017, 34). The development of work aimed at the output of a practice-based thesis requires actors involved in different stages. These different stages of action or development proceed in interaction with the actors in a given operating environment, which includes discussion, evaluation, peer support, reorientation of action, as well as receiving and giving feedback. These all arise only in the social interaction between people. A practice-based thesis has a knowledge base, actors, methods and materials, as well as a result and output that progress logically through different work stages for evaluation. (Salonen 2013, 5-6.) Together agreed rules, procedures, concepts and language guide the work. Research methods, such as surveys, interviews or observations on data collection methods, aim to produce information relevant to development. In addition to this, previous research information is also utilized in development process. (Salonen et al. 2017, 34-35). The work is usually long-term and demanding. With the aim of a functional thesis, the student is able to develop his or her thinking and professional skills, which can be utilized in working life even after completing the degree. (Salonen 2013, 5-6.)

Seven steps can be distinguished in the development process of a practice-based study. The first stage is the identification of the development need, followed by the ideation phase to find solutions, the product planning phase, the implementation phase, the result and output, the evaluation phase and finally the final phase. The transition from one stage to another does not require that the previous stage has ended, for example, contacting commissioners at the product drafting stage may specify a need for development. (Salonen et al. 2017, 51; Jämsä & Manninen 2000, 28.)



## 4.2 Identification of the need for development

Identifying the need for development is the driving force behind development activities. The aim is to improve a form of service already in use or further developing a product when its quality is no longer meets its purpose. It is also important at this stage to form a common understanding of the object of development and to delimit the subject area adequately. It is useful to highlight the views of different parties and stakeholders when identifying needs of the current practice developments. Participatory and discussion-promoting tools such as a mind map, a focus group, a needs analysis or a problem matrix method are used as a support when identifying the need for development. (Salonen et al. 2017, 56-57.)

The idea for this thesis was based on the need observed in working life to work with a clear self-care guide for outpatients with heart failure. Self-care guides for patients with heart failure are more available in Finnish than in English, which is why the English version of the guide was also made since Oulu is constantly internationalizing. There is material available at the moment which can be long and not all patients are motivated to read them. This became apparent at the first meeting of the commissioners in September 2020.

## 4.3 Idea phase

The idea phase to find different alternatives starts when the certainty of the need for development has been obtained. At this stage, answers are sought to the question of what kind of product meets the needs of the customer and the client. A proceeding plan is agreed, in which there is room for possible changes. In order to get different perspectives, it is a good idea to involve as many people and stakeholder as possible to this phase. An evaluation of the idea should also be requested from the commissioner of the development project. (Salonen et al. 2017, 58.)

Authors presented the idea of a simple A4-size and plain language patient guide highlighting the most important means of self-care for heart failure, meaning

which patient can accomplish through lifestyle. It was also agreed with commissioners that the future self-care guide will avoid the use of medical terms. The use of professional terms reduces the comprehensibility of the patient guide, as the patient guide is indirectly aimed at the elderly. The assignment agreement was signed with the commissioners in October 2020. At the same time, it was agreed that authors will deliver the first version of the guide and the current thesis to the client at the end of December 2020. The commissioners promised to provide feedback and make suggestions for improvements in the content and appearance of the guide.

Five self-care themes were selected with the commissioners: self-monitoring, exercise, nutrition, medication and sexuality. This limited the content of the patient guide, as there are many more means. The contents of the patient information leaflet must be based on evidence and the latest information. Thus, the content of the patient self-care guide utilizes the Käypä hoito-recommendation for heart failure and Nursing Research Foundations (Hotus) recommendations on the content of the self-care guidance for heart failure.

#### 4.4 Planning phase

The purpose of the planning phase is to specify the ideas of the idea phase about what kind of product is intended to be designed and manufactured, as creating a customer profile that explains customers' needs and expectations for the product. In the planning phase background research is done by getting familiar with the research information and literature. In addition, the object of development is defined, and a written development plan is drawn up. A development plan is a tool for managing operations through which the implementation of activities is evaluated. The roles and responsibilities of the authors involved, and the resource for the work also needs to be clarified. It is important to ensure that the work is planned as carefully as possible although surprising circumstances may arise which are not possible to prepare advance. (Salonen et al. 2017, 59-60.) After meeting with the commissioners, theoretical information was searched on how project-based thesis is implemented and what are the different stages. Written development plan was made according which the tasks were shared so

that both of us could start working on right away. In terms of communication, e-mail and video calls were chosen to be easiest and fastest way to keep both updated. The processing of tasks always changed according to the situation, because as mentioned, it is not possible to prepare for everything in advance.

When creating a customer profile, the aim is to specify who the primary beneficiaries of the product are and what they are like as users of the product. Customers are served best by a product that has been designed taking into account the needs of the user group. In health care field, the benefit to the customer can come indirectly through service providers, i.e., staff. Taking into account the views of both parties, it ensures that the product and its substance are fit for purpose. (Jämsä & Manninen 2000, 44–45.) The target group of the thesis project included patients with recently diagnosed heart failure. The goal is to increase the awareness of out-patients with heart failure about the means of self-care. Self-care allows patients to influence their own physical well-being through their own actions and thus increase patients' motivation to care. The patient guide also provides a lot of information and skills on how nurses can guide the patient in future situations. A simple and clear patient guide will reach the patients better than an informative guide.

It is necessary to know the regulations, instructions and action programs that guide the operation of the unit for which the product is designed. They can be national, regional, local or unit-specific, even international. Unit-specific guidelines must be taken into account when choosing the content of the product to be developed. The unit may have values and principles that they want to ensure are implemented. Thus, at the latest at the planning phase, professionals with experience in the product to be designed will be consulted. (Jämsä & Manninen 2000, 49-50.) In December 2020, before starting to work on the patient guide, the commissioners were verified whether the Oulu City Hospital has a protocol for the patient guides. Regulations were inquired, especially the font, pictures or other limiting factors regarding the patient guide appearance. It was also asked what regulations the organization has towards the logo of the Oulu city if it is possible to include in the patient guide.

The preparation of the knowledge base started as soon as Oulu City Hospital agreed to be part of the thesis project. Project plan was ready to be presented when authors and commissioners first met in September 2020. During the planning phase three project questions were formed to provide best possible base for building a guide for patients with recently diagnosed heart failure. After defining the project questions the search strategy was developed. The choice of main search terms were guided by the project questions, on the basis of which three search terms relevant to the topic were identified: heart failure, patient guidance, guidance method. Literature searches were performed from the library databases of Lapland University of Applied Sciences. The PubMed (United States National Library of Medicine), ScienceDirect, Cochrane Library and Terveystietokanta were selected as databases to be used. The found material was reviewed critically and systematically as the oldest books and articles accepted were less than 15 years old.

Source criticism can be either external or internal and it refers to assessing the reliability of a document. In external case, issues related to the appearance of the document are examined, and in internal case, the truthfulness of the information presented in the document is addressed. When searching professional knowledge, the reliability and accuracy of the source is emphasized. Thus, the information used must be up-to-date, relevant and reliable. The age of the source is important because in medical field, research data changes rapidly and previous data is considered to accumulate into new research data. The original sources are the best since the information may change a lot in a multiple chain of quotation and interpretation. According to Haasio (2015) the identity of the author says a lot about the reliability of the information. Usually author's degree, position, and work history may indicate that the information presented is current. (Haasio 2015, 17-19.)

During study's authors attended librarian's lectures about how to use school's databases and google for information searching. Information search was done by using different search operations for example OR, AND, quotes and AROUND,

to find specific information about the topic. As members of an international group, more searches were made in English thru PubMed, ScienceDirect, Cochrane Library, Cinahl databases. Keywords used included, among others, the words heart failure, patient guidance and guidance method as well as their Finnish equivalents. Keywords used produced a lot of medical articles but only a few nursing articles, as the topic surrounds the medical field. Also, when searching international articles, it was important to keep in mind that in other countries health recommendations might be different compared to Finland.

Librarian gave tips for using Google Advanced Search and Google Scholar. According to Haasio (2015), a successful search from Google's advanced search is based on the search effective delimitation, the search for which is targeted at certain types of documents, for example by language, publication date or other delimitation option (Haasio 2015, 54). Google's advanced search used several different delimitations and combinations of keywords that managed to find some material suitable for the thesis.

#### 4.5 Implementation phase

When the plan is completed and approved by the organization the implementation phase begins. The guidance and feedback received at this stage are essential for success, as many professional qualifications are activated in the work for example planning, responsibility, interactivity and tolerance for uncertainty. The implementation phase is proceeding according to the solution options, principles and limitations selected in the drafting phase. In this stage plans become more precise as implementation progresses. At this point, it is necessary to produce a variety of materials and take notes to support the work. All material must be documented so that they can be founded at the latest at the evaluation stage. In the implementation phase internal and external communication are essential. (Salonen et al. 2017, 62.) In the end of December 2020, the first version of the patient-guide leaflet was ready, the authors asked feedback from the wards' A3, B3 and H2 nursing staff as well as from the heart failure patients. The feedback received from patients on the guide increases the patient-orientation of the guide.

By collecting feedback, possible shortage of information and suggestions for corrections were sought from the patient guide.

Printed products such as a leaflet are the most common mediator of information. The final choices regarding the content and appearance of the product are made only at the actual stage of production. The choice of content depends on the target group and the purpose for which the information is conveyed. For example, where a patient guide is intended to support the oral guidance of a health professional, the content of the guide may differ from what it would be if it were intended for the patient's own use. Often in the field of health, the subject style is chosen as the text style, the aim of which is to inform and guide. The text of the patient guide must be open to the reader at first reading and the core idea of the text must be clear, which is clarified by the structure and wording of the headings. Another crucial factor is the print layout of the product, for which different word processing programs offer different options. (Jämsä & Manninen 2000, 56-57)

The starting point of the guide is layout, i.e., how the images and text are arranged on the paper serves the content of the guide. A good fold in a guide attracts to read as well as improves comprehensibility. Empty space does not need to be avoided, as the airy fold brings a calm look to the instructions. Patient instructions are usually made on an A4 sheet, so few pages of instructions work best in the vertical model. When using colors, it is a good idea to aim for a restrained end result. However, colored brochures attract more attention than black and white ones. The color of the base of the paper is usually white or light pastel. The patient guide can be divided into several columns. The layout of the patient guide is affected by the text alignment, margin width, font size, and font type. The font size is usually 12. As the target group is elderly, the font size should be increased to meet their needs. The chosen font should be easy to read and clearly distinguishable from the background of the paper. Headlines should be short and clear. (Lipponen, Kyngäs & Kääriäinen 2006, 68.)

Using images in patient guides at their best arouses interest and helps to understand the guidelines. When using images in the patient information leaflet

copyrights must be taken into account, which is why images cannot be copied and used. When selecting images, it is important also to make sure that the illustration in the patient guide does not offend anyone. (Lipponen et al. 2006, 67.) The preparation of the patient guide began with the selection of the image. Free and paid images were searched on various sites. Two pictures were originally chosen in the first version of the guide, but in the end, authors decided made a guide without pictures to get more text. As it makes more sense for the patient guide not to be illustrated than to use them as a filler which can make the guide look messy (Lipponen et al. 2006, 67).

In a good guide, the headings provide information and also lighten and clarify the text. Essentially, the main title tells the most important thing, and the subheadings outline the content of the text. Subheadings also help in compiling text, that nothing important is left out. In one paragraph one should choose things that belong together, and you should be able to come up with your own title for each paragraph, if necessary. The comprehensibility of the sentences is important, and the message should find out in a single order. Common language words are recommended if the reader is a layman. When making a guide, it is to be considered where the text is published and where it is read. The layout of the material about to be printed must be done on paper terms. (Hyvärinen 2005.)

The text of the patient guide was divided into four columns according to the means of self-care, starting with the most important. The columns were titled and listed below were the self-care options. The challenge in the content of the text was to form the means of self-care in an understandable and simple way for the target group. The text was written in a positive tone, as the commissioners requested, so that the patients doesn't get overwhelmed. The patient guide also explains why the instructions should be followed. The patient guide columns were arranged vertically. Garamond was chosen as the font for its clarity and the font size was 12 so that the text would not be too small. White was chosen as the basis for the guide, from which black text and red titles pop up clearly. During the preparation phase of the patient information leaflet, third parties were asked for their opinion on the layout and composition. The patient information leaflet was considered clear and understandable by the third parties.

#### 4.6 Result and output

The results and outputs show the benefits obtained and the changes in operations at the desired object. It is important to take into account the views of actors and beneficiaries on the results or changes achieved. According to the definition of innovation, the result must always add value to the work community. (Salonen et al. 2017, 63.) The self-care guidance highlights the issues that heart failure patients should take into consideration. The recommendations introduce the effects and side effect of overweight, alcohol use, smoking and recommendations about fluid intake, nutrition, salt use, medications, exercise, weight gain and sex life. (Maijala et al. 2018.) The development of the patient-guide leaflet started with the content of self-care, of which five themes were selected in the idea phase. The same themes remained till the end of the project. The authors ended up with an A4-sized patient guide, that folds in three parts making the guide more practical size.

In the patient guide (appendix 2) the self-monitoring part instructs the patient to pay attention to their weight, quit any smoking, and limit alcohol use. Self-monitoring refers to regular monitoring of one's health and performance, heart failure symptoms and oedema. For example, monitoring blood pressure, pulse, weight, fluid and salt use, as well as monitoring of medication implementation and identifying the aggravating impairment and seeking treatment as soon as possible when symptoms clearly increase. (Sydämen vajaatoiminta 2017.)

The exercise section informs the patient about the benefits of exercise; how it lightens heart load by improving blood circulation, lung function, and muscular metabolism. The patient guide includes forms of exercise that are appropriate for the patient with heart failure, include walking, Nordic walking, cycling and skiing. Patients are instructed to exercise for at least 1.5 hours a week divided into three or more times and if symptoms of heart failure occur, exercise should be relieved or avoided (Kutinlahti & Pellikka 2018.)



In the nutrition part patients are encouraged to follow a healthy diet and pay attention the amount of salt and fluid in the diet. Diets recommended where The Dietary Approaches to Stop Hypertension (DASH) and the Mediterranean diet. It is explained how excessive use of salt collects fluid in the body, raises blood pressure and increases the workload of the heart due which the amount of salt recommended for heart failure patients is one teaspoon (about 5 grams) per day (Terveyskylä, 2019). If the patient is severely symptomatic, daily hydration should be limited to 1.5-2 liters (Maijala et al. 2018, 9). Also, appropriate use of alcohol is mentioned (Koivumäki & Hekkala 2018).

The medication section informs the patient to carry out their own personal medication and monitor its effects, as well as to dose diuretic medication according to symptoms and doses agreed with the doctor in advance. Also noting when using excessive dehydration medication, the potential risk of dehydration and about certain medicines that are not recommended for people with heart failure. (Kettunen 2018; Tarnanen et al. 2018.)

The sexuality part guides the patient to have stabilized heart failure and be receiving optimal medical treatment before sexual activity. It is important to be well rested before sexual activity and without other stress factors, as well as stopping to rest if having shortness of breath. Also, it is informed that regular exercise gives the best support for the recovery of sex life. (Jaarsma 2016; Steinke et al. 2013.)

The aim was to prepare an easy-to-read patient guide instead of an informative one. The purpose of the patient guide is to support the oral patient guidance provided by the nursing staff and to encourage the patient to be more active on self-care of heart failure. The patient guide is designed in such a way that it motivates the target group, as it allows the patient to take care of their own personal health and thereby prevent the progression of heart failure.

#### 4.7 Evaluation and the final phase of the thesis project

Evaluation and feedback are needed at different stages of product development. Evaluation presents a critical reflection in relation to the goals set for development. There is no right way to evaluate, it may include, e.g., forms of self-evaluation, external evaluation and / or peer review. Feedback providers can also make suggestions for changes and solutions to the final product. (Salonen et al. 2017, 64-65.) The best way is to test or pre-test the product during its preparation. Test users can be subscribers and customers participating in the productization process. Giving feedback is facilitated if there is an old product alongside which the advantages and disadvantages of the product are emphasized and the need to develop a new product materializes. Feedback providers can also make suggestions for changes and solutions to the final product. Finishing may include refining the details based on feedback or experimental experience. (Jämsä & Manninen 2000, 80-81.)

The guide was submitted to the commissioner by e-mail for evaluation. Feedback was asked on the content and layout of the guide. The commissioners read the guide with nurses from the ward, and the senior physician also had been asked to comment the guide's medication section. Sentences were marked with yellow points that could still be considered to make more understandable (vernacular) for elderly heart failure patients, for example, the Mediterranean diet should be opened up more as many older people do not know what kind of diet it is. Feedback was also enquired from the supervising teacher, whose feedback regarding the text of the guide was also taken into account. When compiling the guide, the challenge was found to be the knowledge of various computer software. Initially, the preparation of the guide was started with Microsoft Word, but problems arose at the stage when printing the pages. Although the pages were managed to get in right order, editing would no longer be successful as the texts would have moved to the wrong pages when editing and there was a blank space left on the sides of the paper so that the guide could not be folded without cutting the edges. Authors decided to made the word file as a PDF so that it could better adjust the page settings when printing.

The development has been successfully completed once the objectives and results set for it have been achieved. In particular, the final phase involves planning what will happen to the results or output in the future: how they will be utilized and how widely the results will be disseminated and implemented. (Salonen et al. 2017, 66.) Once the changes had been made the guide was approved and as the Oulu City Hospital ordered the guide it was provided to them under copyright laws, meaning that Oulu City Hospital has the rights of distribution. The guide will be part of the wards A3, B3 and H2 patient guidance since written material helps to support oral patient guidance.

## 5 DISCUSSION

### 5.1 Thesis process

The thesis project was started at the beginning of May of 2020 first getting the idea paper approved and continuing with the thesis plan that was approved in August 2020. The goal was to get the project ready within a year, so that the thesis could be presented in May 2021. The planned timetable has been mostly followed but, in some parts, like writing the plan which took more time than expected. After all, referring the whole process was faster than expected so by February 2021 the project almost ready. Some external factors influenced the decision as well to move the date forward to March 2021.

The original subject for the thesis wasn't about heart failure and it wasn't supposed to be a thesis project, the subject was changed to keep it more into the nursing field, that is when the heart failure as a subject came up and after a little brainstorm, the idea to do a self-care guide for patients recently diagnosed with heart failure. There was discussion with Oulu City Hospital to see if they would be interested in this kind of guide in English and Finnish, they were on board, so as soon as possible the application filling was started and was sent to them at the beginning of September 2020. The theoretical part of the thesis was as well started so that all the theory that was needed for the project would be ready. The focus was to get the theory in order before the guide writing was started, which happened in December 2020 and the first version of the guide was sent to Oulu City Hospital at the end of the same month. Feedback was given from Oulu City Hospital on the 23 of February 2021 which came from the nurse staff, the feedbacks they got from the pretest and as well feedback from a senior physician. The work on the comments was started as soon as possible and the final version of the guide was sent to them on 2 of March 2021, which was accepted.

The authors live about two and a half hours away from each other and because of the pandemic situation there wasn't many opportunities to meet and work together in the same place, so a big part of the work has been online and the communication has been via WhatsApp and skype. This may have made it a little

bit harder to work, because communication is not the same via texts than face to face. Beside the circumstances the authors were able to work on the project and maintain a fluent communication during the whole process.

## 5.2 Reliability and ethicalness of the thesis

Reliability is an asset that is used to assess the quality of the data collection process, so the study, in this case the thesis, needs to be reliable to be considered valid (Lærd Dissertation 2012). A literature review was used as the method for this research, meaning that information used in this thesis has been used before in professional studies, articles and books. As well the information has been classified and analysed to make sure the information and the sources are reliable. The thesis template from Lapland UAS was used to make sure all the references have been marked in the right way, avoiding plagiarism.

The information displayed in the guide is as well reliable as the information used was the one gathered for the thesis. An asset used to determinate reliability on the guide was the pretest, this consists in presenting the work to a small group, in this case patients and health care workers, to gather information about the content and appearance, giving us the opportunity to change the guide (Waltz, Strickland & Lenz 2010). The pretest was handled by Oulu City Hospital and they revised it as health care workers professionals and provided the guide to ward patients and asked them their opinion. It was felt that the guide wasn't good enough thus it was upgraded and sent it to Oulu City Hospital so they could show the old and new version to the patients and compare them.

Ethics could be defined as the moral principles that guide our decision-making action or as the rules people follows to regulate our behaviour, this comes from our believe in what is right and what is wrong (Ingham-Broomfield 2017; Resnik 2020). There are many reasons of why it is important to follow ethical principles during research, one of them is to promote the aims of research, so that the study, in this case a thesis and a guide, have a trustworthy knowledge, avoiding plagiarism, falsification or misrepresenting data among others (Resnik 2020), this principle has been followed by marking all the references in our text following the

Lapland UAS templates as well as making sure the data recollected was reliable and trustworthy. Another principle involves cooperation, during a research many people can be involved and is important to work in a collaborative way with trust and mutual respect (Resnik 2020). There haven't been many people involved in this project but every time there has been a contact with Oulu City Hospital regarding the guide it has been in a very professional way with respect from both ways. In any kind of research, the principle of non-maleficence is very important, this means that the intentions of the research are not to harm or injure (Ingham-Broomfield 2017). During the research for the project, as it is not a clinical research this principle can't be applied however it can be applied to the guide. The intentions are to help the patients to understand more about heart failure and help them, so there are no maleficent intentions. Regarding the guide it is a commissioned thesis ordered by Oulu City Hospital and the guide that was provided to them is under the copyright laws, meaning that Oulu City Hospital have the rights of distribution.

### 5.3 Development of professional competence

The process of writing the project thesis and the guide has been an interesting and difficult process with a few obstacles. For the authors of this project this was their first big research project, so it has brought a lot of questions along the process as well as new experiences and a lot of new knowledge. Choosing the topic for the thesis took a while, but when finally was decided that the writing would be about heart failure and a focus on a guide on self-care it felt like the right choice. It has been a very rich learning to the authors, a lot was learned about heart failure and its guidance, which will be useful in the working life. There has been as well a learning about research and working together as a team. Apart everything that was learnt about HF itself which will make the authors better nurses with the skills that have been developed to research information in a reliable way.

There have been some difficulties which have affected the process of working on the project, one of them is the current global situation that started at the end of 2019, the global pandemic of Covid-19. This has been a disadvantage working

because almost all the meetings were held online or via email, which made the communication between the authors of the thesis the teachers, and the staff of Oulu City Hospital not as fluent as it could had been in person, as well it diffculted the communication within the two authors. There were no possibilities to meet and work on the project in person, and a few times there where technical problems which made it hard to work together. This difficulty has brought to acknowledge to the authors the need to develop their skills on technical matters, which would had been handy while writing the project.

#### 5.4 Follow-up project idea

After the patient's guide was accepted by Oulu City Hospital, there was a discussion between the authors of the project about what would be a good project to follow the patient's guide. A few ideas came up but only one was considered as follow-up project. The idea consists on a smartphone application directed to people with heart failure where they could find all kind of information that could be useful to them as data about heart failure and its care, diets, exercise and self-care. The application would have as well a section where the patients could do a follow-up of their weight, which is very important part of self-monitoring. There would be also a section where the food intake could be followed with a salt intake meter and calories calculator so that it would be easier to keep track of the food and fluid intake.

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## APPENDICES

### Appendix 1. Sydämen vajaatoiminta: omahoidon opas

#### Seksuaalisuus

New York Heart Associationin (NYHA) mukaan sydämen vajaatoimintaa sairastavan potilaan kyky olla seksuaalisesti aktiivinen riippuu oireiden vakauudesta ja optimaalisesta lääkehoidosta.

Ennen seksuaalista aktiiviteettiä on hyvä levätä ja vähentää muita stressitekijöitä, kuten raskaita aterioita tai runsasta alkoholin käyttöä. Seksuaalisen aktiiviteetin aikana oireita esiintyy harvoin potilailla, jotka eivät koe niitä räsitusoltonaan kohtalaisessa liikunnassa. Säännöllinen liikunta antaa parhaan tuen seksuaalisen elämän palautumiselle, koska se vähentää sydänoireiden riskiä seksuaalisen aktiivisuuden aikana.

Seksuaalista aktiivisuutta ei kuitenkaan suositella potilaille, joilla sydämen vajaatoiminta oireet pahenevat äkillisesti tai joilla on pitkälle edennyt (NYHA luokka III tai IV) sydämen vajaatoiminta. Seksuaalista aktiivisuutta on lykättävä, kunnes tilasi on hallinnassa ja/tai vakaa.

#### Hyödyllisiä linkkejä

Jo olet kiinnostunut ja haluat saada lisätietoja sydämen vajaatoiminnasta, tässä on linkkejä, jotka auttavat sinua alkuun:

[www.terveyskyla.fi](http://www.terveyskyla.fi)

[www.sydanliitto.fi/oulu](http://www.sydanliitto.fi/oulu)

[www.ukkinstituutti.fi](http://www.ukkinstituutti.fi)

[www.ppsydanpiiri.fi](http://www.ppsydanpiiri.fi)

#### Sydämen vajaatoiminta: omahoidon opas

Sydämen vajaatoiminta (HIF) on oireyhtymä, joka johtuu riittämättömästä verenkierrosta kehossa sydämen pumppaustehon puutteen vuoksi. Sydämen vajaatoiminta ei ole itsenäinen sairaus, vaan seuraus verenkiertojärjestelmään vaikuttavasta taustalla olevasta sairaudesta. Yleisimmät perussairaudet ovat korkea verenpaine, sepelvaltimotauti ja sydämen läppävika. Yleisimpiä oireita ovat poikkeava syke, hengenahdistus ja nesteen kertyminen alaraajoihin. Oireet johtuvat sydämen kyvyttömyydestä vastata kehon verenkierron tarpeisiin ja ylimääräisen nesteen kertymiseen. Sydämen vajaatoiminnan hoito keskittyy sydämen vajaatoiminnan taustalla olevan syyn hoitoon ja hoidon perusta on vajaatoimintaa pahentavien tilojen ehkäisy ja hoito. Elintapa muutokset kuten alkoholin rajoittaminen, tupakoimattomuus, painonhallinta ja liikunta ovat tärkeitä osia itsehoitossa.

## Omahoito

Omaseuranta tarkoittaa terveyden ja suorituskyvyn, sydämen vajaatoiminnan oireiden ja turvotuksen säännöllistä seuranta, esimerkiksi verenpaineen, pulssin, painon, nesteiden ja suolan käytön seurannan avulla. Sen lisäksi, että seurataan lääkityksen toteutusta, on hyvä tunnistaa tilan heikentyminen ja haettava hoitoa mahdollisimman pian, kun oireet selvästi lisääntyvät. Paino on mitattava säännöllisesti, koska odottamaton painonnousu (> 2 kg kolmen päivän aikana) liittyy usein pahenevaan sydämen vajaatoimintaan ja nesteen kertymiseen. Huomaa, että päivittäinen punnitus tulisi suorittaa samanlaisissa olosuhteissa, esimerkiksi aamulla kevyiden vaatteiden kanssa.

## Liikunta

Liikunnan on osoitettu vähentävän oireita ja parantavan yleistä hyvinvointia sydämen vajaatoimintaa sairastavilla, koska se keventää sydämen kuormitusta parantamalla verenkiertoa, keuhkojen toimintaa ja lihasten aineenvaihduntaa. Liikunnan aloittaminen vaatii, että sydämen vajaatoiminta on vakaassa tilassa. Tärkeintä on harrastaa urheilua, josta itse pitää. Hyviä liikuntamuotoja ovat kävely, sauvakävely, pyöräily ja hihto. Reipasta liikkumista (esim. sauvakävely) on suositeltavaa harrastaa ainakin 2 tuntia 30 minuuttia viikossa. Lisäksi tulisi tehdä 30–45 minuutin lihasvoimaharjoituksia 1–2 kertaa viikossa.

## Ravitsemus

Ravitsemuksella on erittäin tärkeä rooli sydämen vajaatoiminnan hoidossa; sillä terveellinen ja monipuolinen ruokavalio helpottaa sydämen työtä.

Tiukkaa ravintosuunnitelmaa ei tarvitse noudattaa, esimerkiksi Dietary Approaches to Stop Hypertension (DASH) ja Välimeren ruokavaliot ovat sydänystävällisiä. Välimeren ruokavalio pohjautuu muun muassa vihannesten, kalojen, täysjyvätuotteiden, oliivijölyn, palkokasvien, pähkinöiden käyttöön. DASH ruokavalio perustuu päivittäiseen annokseen, joka vaihtelee ruokavaliota noudattavan yksilön kalorien tarpeiden mukaan. Näiden ruokavalioiden avulla on helppo pitää yllä terveellisiä tapoja, jotka tukevat sydämen terveyttä, kuten vähäinen suolan käyttö.

Liiallinen suolan käyttö kerää nestettä elimistöön, nostaa verenpainetta ja lisää sydämen työmäärää, jonka vuoksi sydämen vajaatoimintaa sairastaville suositeltu suolamäärä on yksi teelusikallinen (noin 5 grammaa) päivässä. Alkoholin suurta kulutusta tulisi välttää, mutta käytettäessä suositeltu enimmäismäärä päivässä on yksi ravintola-annos. Alkoholi kerää nestettä kehoon ja lisää verenpaineen nousua ja rytmihäiriörisiä. Vaikaoireisella potilaalla päivittäinen nesteytys tulisi rajoittaa 1,5–2 litraan. Nesteen rajoitus tulee mukauttaa vallitsevien säätöolosuhteiden ja terveyden tilan (esim. kuume, oksentelu, ripuli) mukaisesti.

## Lääkehoito

Lääkehoidon tavoitteena on välttää oireyhtymän paheneminen ja vähentää sairaalahoitoa.

Lääkeyhdistelmät ovat keskeisiä sydämen vajaatoiminnan lääkehoidossa. Diureetit, angiotensiinikonvertaasin estäjät (ACE) tai angiotensiinireseptorin salpaajat (ATR) ja beetasalpaajat ovat tyyppisiä sydämen vajaatoiminnan lääkehoidossa. Lisäksi vaikaoireiselle voidaan lisätä myös mineralokortikoidireseptorin salpaaja (MRA). ACE:n estäjän tai ATR:n salpaajan tilalla voidaan käyttää ATR:n salpaajan ja neprilysiinin estäjän yhdistelmää, mikäli sydämen vajaatoiminnan oireita on vielä senkin jälkeen, kun ACE:n estäjän, beetasalpaajan ja MRA:n salpaajan annokset on lisätty suurimpiin potilaan sietämiin annoksiin ja diureettihoido on optimoitu.

On tärkeää muistaa ottaa lääkkeet säännöllisesti ja seurata niiden vaikutuksia, sekä annostella diureettilääkkeitä oireiden ja lääkärin kanssa etukäteen sovitun annoksen mukaan. Huomaa myös, että liiallisella diureettien käytöllä on mahdollinen kuivumisen riski. Lääkkeiden käytön aikana uusien oireiden tai ongelmien ilmentyessä, on hyvä ottaa yhteyttä terveydenhuollon ammattilaiseen varhaisessa vaiheessa.

## Appendix 2. Self-Care Guide for Heart failure.

### Sexuality

According to New York Heart Association (NYHA) functional classification of heart failure patient's ability to participate in sexual activity depends on their affliction, being stabilized, and receiving optimal medical treatment.

Before sexual activity, it is good to rest and reduce other stressors, such as heavy meals or heavy alcohol consumption. During sexual activity, symptoms rarely occur in patients who do not experience them with moderate levels of exercise. Regular exercise provides the best support for the recovery of sex life as it reduces the risk of heart symptoms during sexual activity.

However, sexual activity is not recommended patients with sudden worsening of HF symptoms or advanced (NYHA class III or IV) HF, sexual activity should be postponed until your condition is optimally managed and/or stabilized.

### Useful links

If you are interested and want to get more information about heart failure, here are some links to help you with the research:

[www.terveyskyla.fi](http://www.terveyskyla.fi)

[www.sydanliitto.fi/oulu](http://www.sydanliitto.fi/oulu)

[www.ukkinsituutti.fi](http://www.ukkinsituutti.fi)

[www.ppsydanpiiri.fi](http://www.ppsydanpiiri.fi)

## Self-care Guide for Heart Failure

Heart failure (HF) is a syndrome caused by insufficient blood flow in the body due to a lack of heart pumping. Heart failure is not an independent disease but a result of underlying disease that affects the circulatory system. The most common underlying diseases are high blood pressure, coronary heart disease, and various heart valve defects. The most common symptoms include abnormal heartbeat, shortness of breath and fluid retention. Symptoms are caused by the inability of the heart to respond to the needs of the body's blood circulation and the accumulation of excess fluid. Treatment of the heart failure focuses on treating the underlying cause of heart failure and the prevention and treatment of conditions that aggravate the failure are the basis of treatment. Life-style changes as alcohol restriction, non-smoking, weight management and exercise are important parts of self-care.

## Self-Monitoring

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Self-monitoring refers to regular monitoring of one's health and performance, heart failure symptoms and oedema, for example, monitoring blood pressure, pulse, weight, fluid and salt use. As well as monitoring of medication implementation and identifying the aggravating impairment and seeking treatment as soon as possible when symptoms clearly increase. Weight should be measured regularly as the unexpected weight gain (> 2 kg in three days) is often associated with worsening heart failure and fluid retention. Note that the daily weighing should be done under similar conditions for example, in the morning with light clothing.

## Exercise

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Exercise has been shown to reduce symptoms and improve overall well-being in people with heart failure, as it lightens heart load by improving blood circulation, lung function, and muscular metabolism. Starting exercise requires a stable heart failure condition. The main thing is to play sports that you like yourself. Good forms of exercise include walking, Nordic walking, cycling and skiing. It is recommended to exercise briskly (eg Nordic walking) for at least 2 hours 30 minutes a week. In addition, 30–45-minute muscle strength exercise 1-2 times a week.

## Nutrition

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Nutrition plays a very important role on the treatment of heart failure; a healthy diet with rich in nutrients and low intake of sodium can ease up the heart's work.

There is no need to follow a strict nutrition plan, for example the Dietary Approaches to Stop Hypertension (DASH) and the Mediterranean diets are heart friendly. The Mediterranean eating plan is based in the consumption of fruits, vegetables fish, whole grains, legumes, nuts and olive oil. The DASH diet is based in daily serving that vary with the caloric needs of the individual following the diet. With these diets it is easy to keep the healthy habits that can support heart's health, including the low consumption of sodium.

Excessive use of salt collects fluid in the body, raises blood pressure and increases the workload of the heart due which the amount of salt recommended for heart failure patients is one teaspoon (about 5 grams) per day. High consumption of alcohol should be avoided, but when used, the maximum recommended amount per day is one restaurant dose. Alcohol collects fluid in the body and increases the rise in blood pressure and arrhythmias risk. For a severely symptomatic patient, daily hydration should be limited to 1.5-2 liters. Fluid limitation should be adapted to prevailing weather conditions and health conditions (eg, fever, diarrhea, vomiting).

## Medication

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The goal of medical treatment is to avoid aggravation and decrease hospital hospitalization.

Drug combinations are central to the pharmacotherapy of heart failure. Diuretics, angiotensin converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARBs) and beta-blockers are typical in the treatment of heart failure. In addition, a mineralocorticoid receptor antagonists (MRA) may be added for the severe symptomatic. A combination of an ARB and a neprilysin inhibitor may be used instead of an ACE inhibitor if symptoms of heart failure persist even after the doses of the ACE inhibitor, beta-blocker and MRA blocker have been added to the maximum tolerated dose and the diuretic therapy has been optimized.

It is important to remember to take medications regularly and monitor its effects, as well as to dose diuretic medication according to symptoms and doses agreed with the doctor advance. Also note when using excessive dehydration medication, the potential risk of dehydration. If there is development of new symptoms or problems with the medications, you should contact your healthcare professional at an early stage.