



Cardiac Rehabilitation Handbook

Cardiac Rehabilitation Division
Queen Sirikit Heart Center of the Northeast

Preface

Cardiac rehabilitation is a crucial medical process for patients with cardiovascular disease, especially for those who have undergone procedures such as bypass surgery, heart-valve surgery, and balloon angioplasty surgery, as well as patients suffering from chronic heart failure. This cardiac rehabilitation handbook offers guidelines for post operation recovery at home. The handbook covers recommendations for physical activities, exercises, risk factor control, and diet for heart disease patients.

We hope this handbook will be beneficial for patients during recovery and for reducing risk of reoccurrence of the disease, which is the main objective of recovery.

For further enquiry, please visit Cardiac Rehabilitation Division (Fitness Room), Floor 1, Queen Sirikit Heart Center of the Northeast, Faculty of Medicine, Khon Kaen University.

Montri Yasud

Editor

15 November 2018

For more information about cardiac rehabilitation, please visit:

<https://heart.kku.ac.th/rehabilitation-2>



Table of Contents

Contents	Page
1. Importance of cardiac rehabilitation	1
2. Home program for patients with heart disease	1
3. Physical activities and cardiovascular disease prevention	3
4. Cautions during home exercise for cardiovascular patients	5
5. Exercises for cardiovascular patients	6
6. Warming up for exercises	7
7. Exercise intensity (Rate of Perceived Exertion)	8
8. When to stop exercising or doing other activities	9
9. Walking as an exercise	10
10. Exercise at home	11
11. Cardiac rehabilitation for heart failure patients	14
12. Prevention of cardiovascular disease risk factors	16
13. Therapeutic diet for patients with cardiovascular diseases	18
14. Tips for diet selection	19
15. Recommended foods to eat and to avoid	20
16. Activity log: walking at home	22

1. Importance of Cardiac Rehabilitation

Cardiac rehabilitation is a long-term process that focuses on increasing patients' knowledge as well as spreading awareness on the limiting risk factors of cardiovascular disease re-occurrence and encouraging patients to get proper exercise. This cardiac rehabilitation program aims to improve and maintain the physical and psychological health of patients in order to reduce the death rate from heart disease and to help patients return to their normal lives and routines.

2. Home program for patients with heart disease

1. Take medication on time and follow doctor's appointments strictly.
2. Stay relaxed, find a way to release tension or anxiety, and avoid intense or extreme emotions.
3. Coronary artery disease patients must be careful when they experience chest pain. When symptoms present, you must stop doing all activities and take medication by placing one pill under your tongue. If the symptom persists, you may take another pill five minutes after the previous one, but you should not take more than three pills. If the pain is not relieved within 15 – 20 minutes, you should go see the doctor immediately.
4. Exercise regularly. The best exercise is walking, starting with a slow pace and gradually increasing the time or length of the walk. More detailed guidelines for how to walk will be discussed later in this handbook.

5. Avoid extreme exertion or holding your breath during regular activities or exercise. Avoid continuous heavy pushing while urinating or passing stool.
6. Avoid heavy duties, lifting heavy objects, rushed movements, or long work hours without proper rest or pausing.
7. Avoid doing activities in extreme weather: too hot or too cold.
8. Eat a balanced diet, including sufficient amounts of vegetables and fruits to prevent constipation. Avoid fried or stir-fried foods.
9. Eat proper meal portions and rest at least an hour before exercising.
10. Avoid foods in high cholesterol and foods that are too salty or sweet.
11. Refrain from drinking alcohol, tea, or coffee. Refrain from smoking and avoid cigarette smoke.
12. Avoid lifting heavy objects weighing more than 10 kg for the first 6 weeks after hospital discharge, especially for those who have undergone open-chest surgery.
13. Regarding sexual activities, please adhere to the following instructions:
 - Cardiovascular patients who have had open-chest surgery can resume sexual activities 6 weeks after hospital discharge. Patients should be able to climb 2 flights of stairs without panting or having chest pain before they can safely engage in sexual activities.
 - Balloon angioplasty patients may engage in sexual activities the second week after hospital discharge (please refrain from sexual activities if you have chest pain or tiredness when resting or during regular routines).
 - Patients who have undergone cardiac rhythm management device implantation surgery (Pacemaker, AICD, CRT) should discuss guidelines for sexual activities with their doctor.

14. As regards driving, please adhere to the following instructions (refrain from driving if you have chest pain while resting or feel exhausted during regular routines):

- Cardiovascular patients who have undergone open-chest surgery can drive a small-sized car, such as a motorcycle or compact car, 6 weeks after hospital discharge and a big-sized car, such as a truck or bus, 3 months after hospital discharge.
- Balloon angioplasty patients can drive a small car one week after hospital discharge (patients who have undergone a radial artery catheterization can drive 3 weeks after discharge) and a big car or truck 6 weeks after discharge.
- Patients with a pacemaker who no longer have discomfort, lightheadedness, faintness, or an irregular heartbeat, can drive one week after the implantation. However, please consult your doctor before starting to drive a big car like a bus.
- Patients who wear a Automated Implantable Cardioverter-Defibrillator: AICD are prohibited from operating public transport such as buses, taxis, or trucks; before driving a private car or motorcycle, consult your doctor for their recommendations.

3. Physical activities and cardiovascular disease prevention

Patients can benefit greatly from physical activities, even light ones like stretching or walking. Such exercises lower death rates among active patients compared to patients who prefer sitting. Moreover, healthy people have been

shown to have higher rates of ability in completing physical activities, which is linked to a decrease in the death rate from cardiovascular diseases, as well as death rates from coronary heart disease, stroke, obesity, and diabetes. More importantly, physical activity is a primary and secondary prevention method for cardiovascular disease risk factors.

The following are other benefits to the cardiovascular system gained from physical activity:

1. Increases oxygen circulation
2. Decreases oxygen consumption of heart muscles
3. Lowers blood pressure and resting heart rate and prevents the heart from working harder than necessary
4. Increases ability to exercise and helps gain a better control of diet or other symptoms, such as chest pain and changes in EKG during exercise
5. Increases HDL cholesterol (the good kind of cholesterol) and decreases triglycerides in blood
6. Decreases total cholesterol
7. Enhances insulin hormone reaction to blood sugar levels
8. Reduces clumping of blood platelets in blood vessels and reduces inflammatory process, which is one of the major causes of coronary artery disease

4. Cautions during home exercise for cardiovascular patients

Patients should refrain from doing exercise if presented with the following symptoms:

1. Angina unrelated to exercise or while resting
2. Palpitations, arrhythmia (irregular heartbeat), or a faster than usual heartbeat
3. Dizziness or blurriness while resting or changing postures
4. While experiencing an illness, such as fever, diarrhea, or headache, or if recently recovered from a fever
5. If experiencing uncontrollable heart failure – notice swelling (hands or feet) or pitting edema (dented when being pressed); other symptoms include being unable to lie down, shortness of breath, or waking up at night from dyspnea
6. If experiencing a bone or muscle disease that reduces the ability to exercise, such as to the tendons or joints, muscle inflammation, or acute gout attack (warming, redness, burning)
7. If resting heartbeat is higher than 120 beats per minute or lower than 50 beats per minute
8. If resting blood pressure is irregularly high or low (higher than 160/90 or lower than 90/60)
9. Patients who have undergone heart-valve surgery with INR higher than 4 should refrain from exercise. See the doctor immediately if you notice ecchymosis or black stool.

10. Patients who have not completed their balloon angioplasty should consult a physiotherapist before starting home exercise.
11. Patients who have undergone open-chest surgery should avoid weight training to allow proper time for the cut bone to heal; this usually takes 3 months.

5. Exercises for Cardiovascular Patients

For safety, patients should divide exercise into 3 sessions.

Session 1: Warm-up. This should take about 5 – 10 minutes. For warm-up exercise poses, look at the pictures in the next section and repeat 10 times for each pose. Alternatively, you can do a slow walk to prepare your circulatory system and muscles for exercise and to prevent potential damage on muscles, tendons, or joints. Note that warm-up time should be longer for patients with congestive heart failure or poor heart pumping.

Session 2: Continuous exercise. Initially, it is best for patients to start with walking. Once walking is more comfortable, you can change to bicycling or similar activities. However, you need to make sure that the total length of exercise is 150 minutes per week (30 minutes per day, 5 days per week). If you cannot sustain a full course of 30-minute continuous exercise, it can be divided into shorter sessions, with each session being longer than 10 minutes in order to be effective for cardiac rehabilitation.

Session 3: Cool-down. After having finished exercising, you should gradually lower your speed or intensity of activity to allow enough time for blood to circulate back to the heart. This is to prevent insufficient blood being pumped out of the heart, which is the cause of dizziness and fainting.

6. Warming Up for Exercises



Flex your ankle up and downward, and repeat with other ankle.



Front kick and straighten your leg and repeat with other leg.



Lift your knee upward and repeat with other knee.



Lift and stretch both of your arms above your head.



Touch each hand to each shoulder and rotate.



Stretch and bend both arms backward.



Swing your hips left and right.



Stomp softly.

7. Exercise Intensity (Rate of Perceived Exertion)

The intensity of exercise during the early period after hospital discharge should be light to moderate. Patients should notice when they feel slightly tired but not too exhausted. For example, you can still chat or say long sentences without pausing or panting. The perceived exertion rate should be around 11 – 13, as shown in Figure 1. Your pulse during exercise increases from resting pulse for no more than 20 – 30 beats per minute. You can check your own pulse by following the instructions in Figure 2.

Rating	Perceived Exertion
	6 Feels nothing
	7 No exertion
	8
	9 Not feeling tired
	10
	11 Begins to feel tired
	12
	13 Feels somewhat tired
	14
	15 Feels tired
	16
	17 Feels exhausted
	18
	19 Feels extremely exhausted
	20 Maximal exertion

*“Feeling tired but can
still chat or say long
sentences”*

*Proper perceived exertion
rate 11 – 13*

Figure 1 Borg RPE scale

Patients who wear a pacemaker or AICD should consult with their physiotherapist to decide on a proper intensity.

How to check your pulse

1. Place your index and middle fingers on your other wrist.
2. Feel the pulse with the fingers or move the fingers around until you can locate it.
3. Count the number of beats in 1 minute, normally around 60 – 100 beats per minute.
4. This should be done immediately after exercise.



Figure 2 Checking

8. When to Stop Exercising or Doing Other Activities

If you experience any of these symptoms, please immediately stop exercising. If you do not feel better after stopping, please see the doctor immediately.

- Angina: May feel as if heavy objects are being placed on your chest, or pain around the neck, jaw, shoulder, and upper arm, as illustrated in Figure 3.
- Palpitations
- Dizziness or headache
- Nausea or vomiting
- Blurriness or double vision
- Difficulty breathing

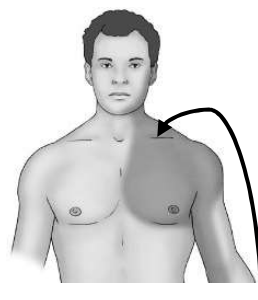


Figure 3 Area where chest pain or angina may occur

These symptoms are signs that your cardiovascular system is unable to adapt to the intensity of exercise. Therefore, you should stop doing exercise and rest in the most comfortable pose until you feel better before continuing with other activities.

However, if the symptoms still linger after rest or occur every time you do exercise, please consult with your doctor or call 1669 (24-hr hotline) in case of emergency. You should not go out for exercise without anybody knowing your whereabouts or without carrying a phone.

9. Walking as an Exercise

Walking is an easy, cheap, and safe exercise for cardiovascular patients. It has been proven that walking regularly is a principal method for preventing cardiovascular disease. Patients are able to do more activities after hospital discharge, and walking is one of them. During the early period after hospital discharge, you should start with a slow walk and gradually increase the length of your walk. Once you can walk more than 15 minutes continuously, you can increase the pace of your walk and can switch between slow walking and speed walking.

However, for the optimal benefit of walking for cardiac rehabilitation, continuous speed walking for more than 10 minutes is recommended. You can use digital gadgets like a Smartphone or exercise wristwatch to count and track the amount of steps you have taken during daily activities as well.

“Walk more, sit less, for a better heart.”

10. Exercise at Home

Week 1 after hospital discharge (use 2 – 3 times more energy than while at rest)

Daily routines	Working/Duty	Exercise
<ul style="list-style-type: none"> - Patients can complete simple routines like getting dressed, hanging clothes, sitting, or eating. - Climb stairs slowly and no more than 10 steps at a time. - Can do simple house chores, such as dusting, sweeping, etc. 	<ul style="list-style-type: none"> - Do not lift any objects weighing more than 2 kg. - Can do simple crafting tasks, such as sewing or wreathing garlands. 	<ul style="list-style-type: none"> - 2 times a day, once in the morning and another time in the evening, 5 minutes each.

Week 2 after hospital discharge (use 3 – 4 times more energy than while at rest)

Daily routines	Working/Duty	Exercise
<ul style="list-style-type: none"> - Can do simple house chores, such as cooking, dishes, 	<ul style="list-style-type: none"> - Do not lift any objects weighing more than 4 kg. 	<ul style="list-style-type: none"> - 2 times a day, once in the morning and another time in the

Daily routines	Working/Duty	Exercise
laundry, and so on.	-Avoid any activities that involve pushing, pulling, or lifting.	evening, 10 minutes each.

Week 3 after hospital discharge (use 4 – 5 times more energy than while at rest)

Daily routines	Working/Duty	Exercise
<ul style="list-style-type: none"> - Can do simple house chores, such as laundry using a washing machine, hanging clothes to dry, and laying bed sheets. - Climb stairs slowly 10 – 15 steps at a time. - Can go grocery shopping. 	<ul style="list-style-type: none"> - Can work on a computer. - Can do gardening, such as trimming and watering using a hose. - Can sweep leaves and plant shrubs. - Can fix small objects. - Do not lift any objects weighing more than 5 kg. 	<ul style="list-style-type: none"> - 2 times a day, once in the morning and another time in the evening, 15 minutes each.

Week 4 after hospital discharge (use 5 – 6 times more energy than while at rest)

Daily routines	Working/Duty	Exercise
<ul style="list-style-type: none"> - Can do house chores, such as mopping the 	<ul style="list-style-type: none"> - Can attend social events. 	<ul style="list-style-type: none"> - 2 times a day, once in the morning and

Daily routines	Working/Duty	Exercise
floor or washing a car. - Walk up and down stairs 15 – 20 steps at a time.	- Can work a part-time job outside of the house. - Can do gardening, such as shoveling or pulling weeds. - Can fix electrical home appliances. - Do not lift any objects weighing more than 6 kg.	another time in the evening, 20 minutes each. - Total length of exercise should be 150 minutes per week.

Week 5 after hospital discharge (use 6 – 7 times more energy than while at rest)

Daily routines	Working/Duty	Exercise
- If there are no abnormal symptoms, patients can do all house chores except for cleaning the bathroom and toilet. - Can carry a 4-kg object up and down the stairs.	- Can do gardening, such as mowing the lawn by hand. - Do not lift any objects weighing more than 7 kg.	- Walking as exercise once a day (morning or evening) for 30 minutes.

Week 6 after hospital discharge (use 7 times more energy than while at rest)

Daily routines	Working/Duty	Exercise
<ul style="list-style-type: none"> - If there are no abnormal symptoms, patients can resume their normal activities that do not make them feel too tired. - Can carry a 6-kg object up and down the stairs. - Heart surgery patients can engage in sexual activity. 	<ul style="list-style-type: none"> - Can return to a full-time job. - Can do agricultural work, such as raising cattle, ploughing using a tool, sawing wood, and so on. - Can do light construction work, such as tile and brick work. - Can fix a car engine. - Do not lift any objects weighing more than 10 kg. 	<ul style="list-style-type: none"> - Walking as exercise once a day (morning or evening) for 30 – 40 minutes. - Do regular exercise 5 days a week with medium intensity.

11. Cardiac Rehabilitation for Heart Failure Patients

For patients with heart failure, receiving the right treatment and practicing discipline in health care, diet control, consuming less salty foods, and doing regular exercise can help improve quality of life and overall physical fitness.

Heart failure patients can get regular exercise; however, they need to follow guidelines strictly and stop all activities if the following symptoms are experienced:

1. Gaining 1 kg within 24 hours or more than 1.8 kg within 3 days; regular weight measurement is highly recommended to monitor this symptom.
2. Feeling exhausted or breathing faster than 30 times per minute when resting.
3. Resting heartbeat is higher than 120 beats per minute, or having palpitations.
4. Swollen legs, less urine, or being unable to lie down.
5. Dizziness or light-headedness, especially when changing postures, such as changing from lying down to sitting or sitting to standing.

Outside from monitoring the above symptoms, patients should practice proper breathing.



1. Breathe in through the nose - extended stomach. Breathe out through the mouth - flat stomach.



2. Breathe in through the nose - extended rib cage. Breathe out through the mouth - flat rib cage.

Patients who receive treatment at the Heart Failure Clinic of Queen Sirikit Heart Center of the Northeast, will receive a cardiac rehabilitation follow-up and go through a 6-minute walking test. Also, patients will receive proper care and regular guidance on how to maintain good health from doctors, nurses, and physiotherapists.

12. Prevention of Cardiovascular Disease Risk Factors

Risk factors include related factors that promote narrowing or blocking of blood vessels. The more risk factors you are exposed to, the higher chance you will be exposed to coronary heart disease. In addition to physical activities for cardiac rehabilitation, patients should control the following potential threatening factors in order to lower the risk of getting coronary artery disease. There are two types of risk factors for coronary artery disease:

1. Uncontrollable risk factors (cannot be avoided) include:

Age: The chance of experiencing the disease increases with age.

Congenital: Patients with a family history of the disease tend to be at higher risk coronary artery disease.

Gender: Males are more likely to be at risk for the disease relative to females.

2. Controllable risk factors (can be modified) include:

High blood pressure: High blood pressure causes strain on your heart. Without proper care, heart muscles will thicken, resulting in an enlarged heart and narrowed, hardened, and blocked vessels. Therefore, patients should watch their systolic pressure and keep it lower than 130 mmHg and watch their diastolic pressure to keep it lower than 80 mmHg.

Smoking: Smokers tend to be 2 – 4 times at higher risk than non-smokers. This is because substances in cigarettes are harmful to the artery linings, causing plaque to build up inside arteries. It is highly recommended that patients quit smoking for good.

Lipid levels in the blood: There are several types of fat in the body:

- *LDL cholesterol, or bad cholesterol.* This is one of the major culprits of accumulated fat on the artery walls. This type of fat is partly created by our own body and partly from high-fat food that is consumed. Patients should keep levels of LDL cholesterol lower than 100 mg per deciliter (or lower than 70 mg per deciliter for high-risk patients).
- *HDL cholesterol, or good cholesterol.* This type of fat helps extract bad cholesterol that accumulates on the artery walls and which is a major cause for coronary heart disease. The body can generate this type of fat and it increases with regular exercise. Patients should keep HDL cholesterol higher than 40 mg per deciliter.
- *Triglyceride fat.* This type of fat is important as it is a major source of energy. It can be obtained partly from starchy foods, sugars, and meats, and is partly created in the liver. Patients should keep triglycerides lower than 200 mg per deciliter.

Diabetes: Diabetes can increase the risk of coronary artery disease by 2 – 8 times. High sugar levels in diabetic patients sabotage blood vessels that supply blood throughout the body. This can lead to arteriosclerosis. Fasting blood sugar level should be around 80 – 110 mg per deciliter, and accumulated sugar (HbA_{1c}) level should be less than 7.

Lack of exercise: People who do not exercise tend to be at higher risk compared to those who exercise regularly. Therefore, it is recommended that patients get regular exercise and strictly follow advice or guidelines from their doctor or physiotherapist.

Obesity: Obese people are those who have a BMI higher than 25 kg per square meter (BMI is a simple calculation using a person's weight divided by their height in meters squared) or a waistline greater than 90 cm for males and 80 cm for females. Therefore, eating a proper diet, including fruits and vegetables, fish, low-fat foods, and non-fried foods, can be crucial for weight and blood lipid control.

Additionally, taking proper and consistent medications, as well as having a positive spirit, can play important parts in primary and secondary prevention of cardiovascular diseases – whether helping to prevent the disease or its reoccurrence.

13. Therapeutic Diets for Patients with Cardiovascular Diseases

Unhealthy diets, such as eating too much or eating unproportioned meals, especially consuming more fat than the body needs, will result in increased blood lipid levels. This excessive fat will go through lining cells in the blood vessels, accumulate inside the walls, and result in narrowed blood vessels, disrupting blood circulation, which is the cause of coronary artery disease.

Eating right can play an important role in strengthening the body and mind. Proper diets can be therapeutic for a disease and for better overall health. The body needs 5 groups of essential nutrients: carbohydrates, proteins, vitamins, minerals, and fat. Each group benefits the body differently; therefore, it is best to consume a variety of food in proper amounts.

Sweet and salty foods are high-energy foods. They can also cause obesity, high blood lipid levels, and diabetes. Besides, salty foods and fermented foods (fermented fish, salted egg, fermented fruits and vegetables; high-sodium foods such as shrimp paste, soy bean curd, fermented fish paste,

and MSG) can cause high blood pressure, resulting in coronary artery disease and paralysis. Consumption of this type of food should be limited, especially fish sauce and soy sauce, which contain different levels of sodium depending on the fermentation method used. Patients should not consume more than 3 teaspoons per day. Salt should be consumed in quantities no more than 1 teaspoon per day.

14. Tips for Diet Selection

Consume flour, wheat, and a lot of fruits and vegetables

It is recommended that you consume 6 – 11 units of carbohydrates per day, such as wheat and flour. It may seem to be a lot, but in fact, a half-cup of oatmeal for breakfast, a sandwich for lunch, crackers for a snack break, and a cup of rice for dinner suffice. Fruits and vegetables are a main source of fiber just as flour and wheat are and can promote digestion. They are also full of vitamins and minerals. You should consume 5 units of fruits and vegetables per day. Frozen vegetables are acceptable but canned fruits and vegetables are not recommended, as the preservation process destroys the nutrients.

Consume some meats and dairy products

Meats and dairy products are a major source of nutrients for children. Adults do not need them as much as children do. Therefore, patients should be selective and eat them only in proper amounts. However, meats and dairy products are great sources for calcium, iron, and vitamin B – helping to strengthen bones and teeth, as well as repair degraded cells in the body. It is recommended that you drink skimmed milk, cheese, and low fat drinking yoghurt and eat meat without its fat. Consume less fat and sugar

Though this type of food may taste good, in the long run it will do more harm than good. Fats can cause coronary artery disease and increase the risk of some cancers. Similarly, sugar is directly linked to obesity and increased risk for heart disease, as well as diabetes. High-fat foods cause the body to have excessive fat accumulation on blood vessel walls and lead to high lipid levels in the blood, which is the major cause of coronary artery disease. Therefore, for the sake of your health, limiting intakes of fat and sugar is highly recommended. You can consume alternative low sugar foods and drinks, such as choosing low-fat drinking yoghurts with fruits, adding smaller amounts of extra fat on your food, for example by spreading butter on just a half of the bread, changing cooking methods from frying to boiling, roasting, or grilling, and so on.

15. Recommended foods to eat and to avoid

Types	Amount/day	Recommended	Avoid
Drinking water	6 – 8 portions (1 portion = 240 ml)	Fresh water, spring water, fruit juice, or non-caffeinated drinks	Soda drinks, coffee, alcoholic drinks, as these drinks can cause dehydration
Fresh fruits and vegetables	5 – 9 portions (1 portion = 1 medium piece or a half cup)	Fruits high in vitamin C such as cantaloupe, orange, grapes, and tomatoes; Green vegetables such as spinach, broccoli, and lettuce	Stir-fried vegetables or overcooked vegetables; Vegetables baked with butter or cheese; Canned fruits or vegetables with added sugar

Types	Amount/day	Recommended	Avoid
Flour and grains	6 – 11 units (1 unit = half a cup of rice or 1 slice of bread)	Roasted nuts, oats, red rice, whole wheat bread, potatoes, millet, and lotus seeds	Wheat and grains with added sugar, fried potatoes, fried nuts, white bread, desserts, baked goods
Dairy products	2 – 3 units (1 unit = 1 cup or 30 ml)	Non- or low-fat dairy products	Whole milk, cheese, butter, ice cream, cream, sugary drinking yoghurts with fruit flavors
Meat	2 – 3 units (1 unit = 90 g)	Chicken without skin, fish, pork without fat	Meats with fat, entrails, processed meat such as sausages
Fat and sugar	0 – 3 units (1 unit = 1 tea spoon)	olive oil, rice bran oil, soybean oil, sunflower oil, safflower oil, corn oil, and natural fat content in fresh fruits and vegetables	Butter, animal fat (saturated fat), palm oil, coconut oil (found in creamer), sugar from sweets, candy, and cakes

16. Activity Log: Walking At Home

Date	Time	Duration (Minutes)	Length (Meters)	Pulse rate		Tiredness	Other symptoms
				Before	After		
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						

Date	Time	Duration (Minutes)	Length (Meters)	Pulse rate		Tiredness	Other symptoms
				Before	After		
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						
	Morning						
	Evening						

Memo:

[illegible]

[illegible]

Authors

Montri Yasud	(Physiotherapist)
Panadda Yasud	(Physiotherapist)
Benja Songsaengrit	(Physiotherapist)
Montana Donsom	(Physiotherapist)
Supattra Chantawong	(Physiotherapist)
Nichamon Ekphaphan	(Physiotherapist)
Worrawut Usuparach	(Physiotherapist)
Chutikarn Sakpisuttikun	(Nutritionist and Dietitian)

Consultant

Pajeemas Kittipanya-ngam, MD.

Editor and Cover Book Design

Montri Yasud

Edited November 2018

1st publication: 200 copies

For more information on heart rehabilitation
visit: <https://heart.kku.ac.th/rehabilitation-2>





Cardiac Rehabilitation Division

Queen Sirikit Heart Center of the Northeast

Faculty of Medicine
Khon Kaen University

<https://heart.kku.ac.th>

043-232700 to 68254 or 68160