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# Prevention and Rehabilitation of Chronic Diseases, Exercise Therapy for Chronic Disease Rehabilitation

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## Abstract

Chronic diseases, also known as non communicable diseases (NCDs), refer to diseases that have a long course, slow progression, are difficult to cure, and typically require long-term medical care. Common chronic diseases include hypertension, diabetes and stroke. These diseases not only seriously affect the quality of life of patients, but also bring heavy economic burden to families and society. This article will focus on exploring the application and effectiveness of exercise therapy in chronic disease rehabilitation from the perspectives of prevention and rehabilitation.

## 1、 The harm and current situation of chronic diseases

Chronic diseases not only endanger human health, but also have a huge impact on the social economy. According to statistics, deaths caused by chronic diseases account for 86.6% of the total mortality rate among residents in China, and the disease burden accounts for 70% of the total disease burden. These diseases not only damage the willpower and resistance of the human body, leading to multiple organ functional damage such as heart failure and renal failure, but also easily induce a variety of complications, such as retinopathy in diabetes, coronary heart disease and stroke in hypertension. In addition, chronic diseases also increase economic burden, affect labor capacity and quality of life, and bring enormous pressure to patients and their families.

## 2、 The main risk factors for chronic diseases

Chronic diseases are influenced by various factors such as economy, society, ecological environment, lifestyle, and genetics. Among them, hypertension, hyperlipidemia, hyperglycemia, overweight and obesity, smoking, unhealthy diet, lack of exercise, and excessive alcohol consumption are important risk factors for chronic diseases. These unhealthy habits have accumulated over a long period of time, gradually eroding people's health.

**Hypertension:** Hypertension is the main risk factor for cardiovascular and cerebrovascular diseases, and long-term hypertension can lead to damage to organs such as the heart, blood vessels, and kidneys.

**Hyperlipidemia:** dyslipidemia, especially the increase of low density lipoprotein cholesterol (LDL-C), is the main cause of atherosclerosis.

**Hyperglycemia:** diabetes is a metabolic disease. Long term hyperglycemia will damage multiple organs in the body, especially the eyes, kidneys, heart, blood vessels and nerves.

**Overweight and obesity:** obesity is an important inducement for a variety of chronic diseases, increasing the risk of cardiovascular and cerebrovascular diseases, diabetes, cancer, etc.

**Smoking:** Smoking is a risk factor for various cancers, cardiovascular diseases, and respiratory diseases.

**Unhealthy diet:** A high salt, high sugar, and high-fat diet is an important cause of chronic diseases.

**Lack of exercise:** Long term sitting without movement leads to decreased physical function and increases the risk of chronic diseases.

**Excessive alcohol consumption:** Excessive alcohol consumption can lead to various chronic diseases such as alcoholic liver disease and hypertension.

### 2、 Characteristics of chronic diseases

#### 1. Long duration of illness

A significant characteristic of chronic diseases is their long course of illness. Compared to acute diseases, the symptoms of chronic diseases often take a longer time to manifest and progress slowly. For example, chronic diseases such as diabetes and hypertension may have no obvious symptoms for many years, but with the development of the disease, a series of complications will gradually appear. Therefore, chronic disease patients require long-term treatment and management to ensure stable condition.

## **2. Difficult to cure**

Chronic diseases are often difficult to completely cure and require long-term or even lifelong treatment. This is mainly because the pathogenesis of chronic diseases is complex and involves multiple factors working together. Although modern medicine has made significant progress in the treatment of chronic diseases, many chronic diseases still cannot be completely cured. Therefore, patients need to establish a long-term treatment concept and actively cooperate with the doctor's treatment plan to control the progression of the disease.

## **3. Symptoms are not obvious**

Many chronic diseases may not have obvious symptoms in the early stages, and may even be completely asymptomatic. For example, chronic diseases such as hypertension and diabetes may have only mild discomfort at the beginning of the disease, such as headache and fatigue, which are easily ignored by patients. Therefore, early detection and diagnosis of chronic diseases are particularly important. Through regular physical examinations and screenings, potential health problems can be identified in a timely manner, enabling effective intervention measures to be taken.

## **4. Easy to recur**

Although the symptoms of chronic diseases may not be severe, they can easily recur. Even if patients persist in taking medication and treatment for a long time, their condition may worsen due to certain triggering factors such as infection, fatigue, etc. Therefore, patients with chronic diseases need to closely monitor their physical condition, adjust their treatment plans and lifestyle in a timely manner, in order to prevent the recurrence of the disease.

## **5. Multiple complications**

Chronic diseases may lead to various complications, further exacerbating the patient's condition. For example, diabetes may cause cardiovascular disease, kidney disease, neuropathy and other complications; Hypertension may lead to serious consequences such as cerebral hemorrhage and heart failure. These complications not only increase the difficulty and cost of treatment, but may also endanger the patient's life. Therefore, preventing and controlling complications is one of the important goals of chronic disease treatment.

## **6. Heavy socio-economic burden**

Chronic diseases impose a heavy economic burden on patients, families, and society. Due to the long-term treatment and management required for chronic diseases, medical expenses are often higher. In addition, chronic diseases may also lead to a decrease in the patient's labor force or loss of work ability, further increasing the economic burden on the family. Therefore, strengthening the prevention and management of chronic diseases is of great significance for reducing the

social and economic burden.

### **3、 Rehabilitation needs for chronic diseases**

#### **1. Drug therapy**

Drug therapy is one of the main treatment methods for chronic diseases. By following medical advice and using antihypertensive drugs, hypoglycemic drugs, antibiotics, and other medications, symptoms can be controlled and the further development of the disease can be prevented. However, drug treatment is not an overnight process, and patients need to take medication for a long time or even for life. Therefore, patients need to fully understand the usage, dosage, and precautions of the medication to ensure its safety and effectiveness.

#### **2. Aerobic training**

Aerobic training is an important component of chronic disease rehabilitation treatment. Aerobic training refers to training methods that require oxygen participation, such as cycling, brisk walking, jogging, swimming, etc. This type of exercise can enhance cardiovascular function, promote fat metabolism, improve the body's immunity, and help improve the physical condition of chronic disease patients. However, aerobic training requires a certain level of intensity and time to produce good results. It is generally recommended to do 3-5 aerobic exercises per week, each lasting 30-40 minutes. At the same time, patients need to choose appropriate exercise methods and intensities based on their physical condition and the doctor's advice.

#### **3. Physical therapy**

Physical therapy is a treatment method that promotes patient recovery through physical means. Including various methods such as hot compress, cold compress, massage, traction, etc. Physical therapy can help patients relieve muscle tension, improve blood circulation, promote tissue repair, etc., which can help alleviate the symptoms of chronic disease patients and improve their quality of life. However, physical therapy needs to be conducted under the guidance of professionals to ensure the safety and effectiveness of the treatment.

#### **4. Psychological therapy**

Psychological therapy is one of the important means of treating chronic diseases. Chronic diseases often bring significant psychological pressure and burden to patients, such as anxiety, depression, and other emotional problems. Psychological therapy can help patients reduce emotional stress, alleviate symptoms such as mental tension and anxiety, thereby maintaining physical health. Common psychological therapy techniques include cognitive-behavioral therapy, psychodynamic therapy, supportive psychotherapy, etc. Patients can choose appropriate psychological treatment methods based on their own situation and receive treatment under the guidance of professionals.

## **5. Health education**

Health education is an indispensable part of chronic disease treatment. Through health education, patients can learn about chronic diseases, master self-management and self treatment abilities, and improve their quality of life. The content of health education includes disease awareness, dietary adjustments, exercise guidance, medication use, and other aspects. Patients can acquire health knowledge through participating in health education courses, reading relevant books and materials, and other means. At the same time, medical staff should also strengthen health education and guidance for patients to ensure that they can correctly understand and apply health knowledge.

## **4、 Basic principles of exercise therapy**

Exercise therapy refers to a training method that uses different types of equipment, manual operation, or patient controlled strength to achieve full body or local motor ability and functional recovery through appropriate exercise methods (active or passive). It combines knowledge from multiple disciplines such as sports physiology, anatomy, and biomechanics, aiming to promote the recovery and improvement of bodily functions through exercise stimulation.

### **1. Aerobic exercise**

Aerobic exercise refers to a form of exercise that involves continuous and rhythmic contractions and relaxations of the body's large muscle groups, thereby increasing oxygen intake, consuming energy, and improving cardiovascular function. Common aerobic exercises include running, swimming, cycling, etc. Aerobic exercise can lower systolic and diastolic blood pressure during rest, reduce the amplitude of blood pressure elevation during exercise, and help prevent and control hypertension. At the same time, it can also improve blood lipid metabolism, reduce bad cholesterol, and increase good cholesterol, which is of great significance for the prevention and treatment of hyperlipidemia and arteriosclerosis.

### **2. Strength training**

Strength training is a form of exercise that enhances muscle strength and endurance by resisting gravity or external resistance. Common strength training includes weightlifting, squats, push ups, etc. Strength training can not only increase muscle mass and improve basal metabolic rate, but also improve bone density and prevent osteoporosis. For patients with chronic diseases, moderate strength training can help enhance their body's resistance and improve their quality of life.

### **3. Flexibility training**

Flexibility training refers to a form of exercise that increases joint range of motion and muscle elasticity through stretching and other movements. Common flexibility training includes yoga, stretching exercises, etc. Flexibility training can relieve muscle tension, prevent sports injuries, and

improve overall coordination and balance of the body. For chronic disease patients, regular flexibility training can help improve body posture and reduce pain.

## **5、 The rehabilitation effect of exercise therapy on common chronic diseases**

### **1. Cardiovascular diseases**

Cardiovascular disease is a type of chronic disease that seriously threatens human health, including coronary heart disease, myocardial infarction, heart failure, etc. Exercise therapy plays an important role in the rehabilitation of cardiovascular diseases. Aerobic exercise can improve cardiovascular and pulmonary function, enhance myocardial contractility, and improve heart pumping efficiency. At the same time, it can promote the establishment of collateral circulation and improve myocardial ischemia. Strength training helps to enhance the thickness and elasticity of the myocardial wall, improving the reserve capacity of the heart. Research shows that regular aerobic exercise and strength training can significantly reduce the incidence rate and mortality of cardiovascular diseases.

### **2. Hypertension**

Hypertension is a common chronic disease, and long-term hypertension can lead to damage to multiple target organs such as the heart, kidneys, and cerebral blood vessels. Exercise therapy is one of the important non pharmacological treatments for hypertension. Aerobic exercise can lower systolic and diastolic blood pressure during rest, reduce the amplitude of blood pressure rise during exercise, and effectively control blood pressure. In addition, exercise can improve endothelial function, promote the release of vasodilators such as nitric oxide, and further lower blood pressure. For hypertensive patients, regular aerobic exercise combined with moderate strength training is an effective method for controlling blood pressure and preventing complications.

### **3. diabetes**

Diabetes is a metabolic disease characterized by hyperglycemia, long-term hyperglycemia can lead to a variety of complications. Exercise therapy plays an important role in the rehabilitation of diabetes. Aerobic exercise can increase muscle uptake and utilization of glucose, and lower blood sugar levels. Meanwhile, it can also improve insulin resistance status, promote insulin secretion and functional recovery. Strength training can help increase muscle mass, improve basal metabolic rate, and further lower blood sugar levels. For patients with diabetes, regular aerobic exercise and strength training are important means to control blood sugar and prevent complications.

### **4. Obesity**

Obesity is a chronic metabolic disease caused by many factors, which can lead to many complications, such as hypertension, diabetes, hyperlipidemia, etc. Exercise therapy plays an important role in the rehabilitation of obesity. Aerobic exercise can increase energy expenditure, promote fat breakdown and burning, thereby achieving the effect of weight loss and slimming. At the same time, it can also improve cardiovascular function and increase the body's metabolic level. Strength training can help increase muscle mass, improve basal metabolic rate, and further promote fat burning. For obese patients, regular aerobic exercise and strength training combined with reasonable dietary control are the key to successful weight loss.

## **5. Osteoporosis**

Osteoporosis is a systemic bone disease characterized by reduced bone mass and microstructural damage to bone tissue, which can easily lead to serious consequences such as fractures. Exercise therapy plays an important role in the rehabilitation of osteoporosis. Strength training can increase the load stimulation on bones, promote bone formation and reconstruction processes, thereby improving bone density and strength. Aerobic exercise can help improve cardiovascular function, enhance muscle strength, improve body balance and coordination, and further reduce the risk of fractures. For patients with osteoporosis, regular strength training and aerobic exercise combined with moderate calcium and vitamin D supplementation are effective methods for preventing and treating osteoporosis.

## **6、 Precautions for Exercise Therapy**

### **1. Individualization principle**

Everyone's physical condition and exercise ability are different, so exercise therapy should follow the principle of individualization. When developing an exercise plan, factors such as the patient's age, gender, condition, and exercise habits should be fully considered to develop a suitable exercise plan for the individual.

### **2.Step by step**

Exercise therapy should follow the principle of gradual progression. At the beginning of exercise, gradually increase the amount and intensity of exercise from low intensity and short duration. Avoid sudden increases in physical activity that may cause discomfort or injury to the body.

### **3. Safety first**

Exercise therapy should prioritize safety. Adequate warm-up activities should be carried out before exercising to reduce the risk of sports injuries. People with chronic diseases should exercise under the guidance of a doctor and strictly follow medical advice.

### **4. Comprehensive treatment**

Exercise therapy should be combined with other treatment methods to form a comprehensive

treatment system. For patients with chronic diseases, relying solely on exercise therapy often fails to achieve ideal rehabilitation results. Therefore, comprehensive treatment should be carried out by combining drug therapy, dietary control, psychological intervention and other means to improve the rehabilitation effect.

## **7、 Conclusion**

Exercise therapy, as a non pharmacological treatment, plays an important role in the rehabilitation of common chronic diseases. Through various exercise methods such as regular aerobic exercise, strength training, and flexibility training, it can significantly improve patients' cardiovascular function, metabolic level, and quality of life, and promote disease recovery. However, it should be noted that exercise therapy should follow the principles of individualization, gradual progress, and safety first to ensure the maximization of rehabilitation effects and avoid other impacts caused by excessive exercise. At the same time, a comprehensive treatment system should be formed by combining other treatment methods, and moderate exercise should be carried out according to medical advice to improve rehabilitation effects.