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Weight Management for the Elderly Population Who have Sustained a Lower Limb Amputation: Resource Manuals for Clinicians

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WEIGHT MANAGEMENT FOR THE ELDERLY POPULATION WHO HAVE SUSTAINED
A LOWER LIMB AMPUTATION: RESOURCE MANUALS FOR CLINICIANS

By

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Master of Occupational Therapy, University of North Dakota, 2013

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This Scholarly Project Paper, submitted by Lauren Battles and Maia Sobolik in partial fulfillment of the requirement for the Degree of Master of Occupational Therapy from the University of North Dakota, has been read by the Faculty Advisor under whom the work has been done and is hereby approved.

Signature of Faculty Advisor

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Title Weight Management for the Elderly Population Who Have Sustained a Lower Limb Amputation: Resource Manuals for Clinicians

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Lauren Battles
November 5, 2013

Maia Sobolik
November 5, 2013

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ABSTRACT

It is becoming more common for individuals to sustain a lower limb amputation, thus impacting their ability to participate in functional tasks of daily living such as ambulation, balance, dressing, driving, and toileting. Approximately two million people within the United States are living with an amputation, most commonly in the lower extremity (Amputation Coalition, 2013). According to Resnik and Borgia (2011), by the year 2050, the number of lower limb amputations will increase significantly due to the aging population who encounter a variety of debilitating diseases such as diabetes, peripheral artery disease (PAD), dysvascular, and/or heart diseases. Weight management is an issue a significant percentage of individuals struggle with. According to the National Center for Health Statistics (2012), 69.2 percent of Americans are overweight. This trend in weight gain is also present in the amputee population and significantly affects the quality of life for these individuals because it is more strenuous on their remaining joints. For those who have a lower limb amputation, the daily battle with weight issues impacts the way the prosthetic fits the affected limb. If an individual is overweight, there is more fatty tissue within their affected limb, thus preventing the prosthetist from firmly applying the socket to the limb. Whereas, for those who have firmer muscles and less fatty tissue, they are able to have a better fit of their prosthetic socket; therefore, giving patients, better control, support, and stability for daily activities (Kahle & Highsmith, 2008).

Significant research has been conducted regarding the various aspects of rehabilitation, strengthening, and community reintroduction for elderly clients who have undergone a lower limb amputation. However, these studies have not addressed the need for weight management as an essential aspect in this populations' life. Therefore, the purpose of this project is to explore and develop a weight management resource for clinicians working with the elderly client who has experienced a lower limb amputation. These resources will consist of nutritional and fitness manuals to help individuals continually manage their weight to ensure their prosthetic device fits properly on a consistent basis.

Through extensive research of evidence-based literature, the authors identified key concepts used to develop a product that benefits the elderly population who have a lower limb amputation. With the concepts identified through the literature review, two manuals were produced to guide clinicians on proper implementation of therapeutic exercises and nutritional aspects of weight management to assist their patients. The manuals also contain client handouts, allowing the clients to take the procedures home with them to continue maintaining their weight management routine. The information provided within the manuals was meant to assist elderly individuals develop lifelong routines, habits, and roles to promote independence and quality of life. The anticipated results of this project are to assist clinicians in helping the elderly who have sustained a lower limb amputation maintain their weight on a regular basis, and ensure a consistent fit of their prosthetic device. This will then enable clients to participate more fully in daily occupations with

increased volition and performance capacity.

CHAPTER I

INTRODUCTION

Amputation is a growing concern within the United States. According to Amputation Coalition (2013), there are approximately two million people living with an amputation, most commonly in the lower extremity. According to Resnik and Borgia (2011), by the year 2050, the number of lower limb amputations will increase significantly due to the aging population who encounter a variety of debilitating diseases. An extensive literature review was conducted and it displayed many commonalities, which identified reasons for an increase of diseases and amputations within the United States. It was identified that obesity is a major concern within the elderly population, thus impacting their overall quality of life.

According to the National Center for Health Statistics (2012), 69.2 percent of Americans are overweight. Obesity is a major contributor to the increasing chronic conditions and health complications seen within the United States. Therefore, it is important to educate individuals both before and after acquiring diseases or amputations about the benefits of participating in healthy weight management routines. There is currently no specific weight management program designed for the elderly population with lower limb amputation; therefore, the authors hope this weight management

resource will help clinicians assist clients to increase healthy habits and routines, thus leading to a healthier lifestyle and increasing overall quality of life.

According to Kahle and Highsmith (2008), when an individual is overweight, it is harder to fit a prosthetic device to the affected limb appropriately. This is due to the increased fatty tissue found within the limb, which prevents the way the socket of the prosthetic device is fitted. In order for a socket to be fitted to the limb properly, it needs to have a firm foundation supplied by the muscles. Therefore, not only does obesity lead to chronic conditions and amputations, but it also affects the individual's quality of life after the amputation because an ill-fitted prosthesis can impact an individual's ambulation and how he or she performs daily activities.

This weight management resource was designed for clinicians assisting the elderly population with lower limb amputations due to the various co-morbidities and complications seen within the personal experience of one of the authors (L. Battles) regarding the effects of a lower limb amputation. The author has seen an individual within her family struggle with the effects of an amputation and how weight management is a crucial factor for proper prosthetic use, and overall performance in daily activities.

The interventions that will be utilized within this weight management resource include: educating occupational therapists and clients about proper weight management and supplying nutrition and fitness manuals with specific considerations regarding the most common causes leading to amputations in this population, which are diabetes and peripheral artery disease. Inside the nutrition manual, therapists will obtain general information regarding nutritional concepts and the benefits of healthy eating, importance of the basic food groups, and sample recipes with recommendations for specific dietary

considerations for chronic diagnoses. By participating in a healthy eating routine, it can lead to decreased cholesterol, weight loss, and increase well-being. The fitness manual consists of general recommendations for physical exercise for older adults, important muscle groups, sample exercises, and specific recommendations for the main causes of amputations within this population.

Factors that might influence the application of this weight management resource include: lack of commitment from therapists to implement these manuals into therapy sessions due to time restrictions, failure to provide clients with handouts to continue incorporating key concepts after discharge, lack of commitment from clients to integrate these concepts into daily life and utilizing the manuals to full potential, and lack of volition from clients to participate in a healthier lifestyle. In order for this weight management resource to work, dedication from both the therapist and the client is required. Therapists need to express enthusiasm when educating clients about the benefits of properly managing their weight and provide supplemental information provided within the manuals to the clients so they can continue implementing the concepts into daily life.

Extensive literature was reviewed in order to provide the justification of this weight management resource. The key concepts and terms used for the literature review included: amputation, elderly population, diabetes, peripheral artery disease, dysvascular disease, nutrition, physical fitness, obesity, prosthetic device, prosthetic rehabilitation, and socket fit. The theory used to develop this weight management resource was the Model of Human Occupation (MOHO). This model was chosen for its core concepts of volition, habituation, and performance capacity as well as the impact of the environment on individuals and their occupations. Increasing the client's volition to develop healthy

habits and routines can lead to increased performance capacity in daily life. It was also chosen because the overall focus of this model is to promote occupational adaptation, which correlates to the amputee population because of the vast changes usually experienced during daily life.

The following chapters included within this scholarly project will address the aforementioned information in greater detail. Chapter II will discuss the findings of the extensive literature review that was conducted in order to provide justification for this weight management resource. It will also provide current and solid research addressing the key concepts and terms previously mentioned. Chapter III provides a description of the process and methodology used when designing this project and an overview of the developed products. Chapter IV presents an overview of the final product, which is comprised of the fitness and nutrition manuals. It will also discuss the MOHO model in greater detail and explain the relevance this model has with this specific project. Chapter V will provide a summary of the overall purpose of the project, limitations of the project, and recommendations for the future. The appendices will include the permission slips from various websites allowing the authors to reproduce images and the completed fitness and nutritional manuals and finally a reference list will be provided that includes all of the references utilized throughout this project.

CHAPTER II

LITERATURE REVIEW

Introduction

There are approximately two million Americans who have experienced an amputation after the age of 65 due to some type of vascular interruption (Amputation Coalition, 2013). An amputation is the intentional surgical removal of a limb or body part. It is most commonly performed to remove diseased tissue or to alleviate pain (Medical Dictionary, 2013). Amputation can be one of the most physically and psychologically disturbing events an individual can encounter because it causes major disfigurement and decreases an individual's level of independence. Lower limb amputations impact individual's functional tasks of daily living such as ambulation, balance, dressing, driving, and toileting; thus, requiring retraining to the modified tasks.

Significant research has been conducted on the various aspects on how to rehabilitate, strengthen, and reintroduce elderly patients into the community who have undergone a lower limb amputation. However, these studies have not addressed weight management as an essential aspect in this populations' life. Weight management is an issue a significant percentage of individuals struggle with, especially those who are elderly and have encountered a lower limb amputation because weight may affect the way the prosthesis fits the affected limb. Not only does an individual have to cope with his or her amputation, there are many other aspects amputees struggle with including:

diabetes, nutrition, pain management, self-perception issues, exercise, decreased muscle mass, balance problems, weight bearing issues, prolonged stump loading, decreased rehabilitation outcomes, decreased independence, and other co-morbidities.

The purpose of this project is to explore and develop a weight management resource for clinicians to implement with the elderly population who has experienced a lower limb amputation. According to Amosun, Mutimura, and Frantz (2005), this population has a lack of knowledge with regard to where they can complete exercises and which exercises they should perform as well as the impact nutrition can play in their daily lives, thus impacting their ability to manage their weight correctly. This resource will consist of nutrition and fitness manuals, which will assist individuals to manage their weight in a healthy manner to ensure their prosthetic fits properly on a consistent basis. The nutrition plan will consist of important concepts related to living a healthy lifestyle through consuming the foods with the proper nutritional values. It will also contain healthy sample menus to promote healthier food options as well as portion control. The fitness manual will address general recommendations for physical activity in older adults as well as the major muscle groups and specific exercises targeting these muscles.

Special considerations for the main causes of amputation within the elderly population such as diabetes, peripheral artery disease, and dysvascular disease will be addressed in both manuals. The literature review will discuss the following topics with specific attention to the elderly amputee population: the rehabilitation process following a lower limb amputation, effects of physical fitness and weight bearing on the affected limb, the role of diabetes and peripheral artery disease in relation to amputations, coping strategies, and the individual's self-perception of his or her amputation and how it affects

daily life.

Problem Statement

Amputation is a growing concern within the United States because it can have a profound impact on individuals and how they function on a daily basis. It is becoming more common for individuals to sustain a lower limb amputation, in relation to major health concerns, thus impacting their ability to participate in functional tasks of daily living such as ambulation, balance, dressing, driving, and toileting. According to Resnik and Borgia (2011), by the year 2050, the number of lower limb amputations will increase significantly due to the aging population who encounter a variety of debilitating diseases such as diabetes, peripheral artery disease, and dysvascular and/or heart diseases. According to Fletcher et al. (2001), arteriosclerotic vascular disease is a growing concern in the elderly population. It has been estimated that people who are 65 years and older currently make up 75 percent of all lower limb amputations. Some of the major causes for these amputations are related to vascular diseases and other health complications (Fletcher et al., 2001). Nutritional aspects are important to consider in relation to the causes of health issues because with many of the different diseases, amputations may either be prolonged or prevented from occurring.

Diabetes and peripheral artery disease. Carmona et al. (2005) conducted a study regarding the role of diabetes and peripheral arterial disease in the elderly population with lower limb amputations. Diabetes was present in almost half of the participants whereas severe peripheral arterial disease was present in nearly all of the participants. The results the authors discovered indicate that both of these diseases increase the likelihood of people undergoing amputations due to the symptoms that are

associated with these diseases. The authors concluded that many of the participants experienced poor prognosis after the amputation due to surgery complications including: congestive heart failure, atrial fibrillation, obesity, and dementia (Carmona et al., 2005).

Diabetes is caused by the insufficiency of insulin, resistance to insulin, or both, causing the person to go into shock if his or her insulin has been interrupted in any way (PubMed Health, 2012). Worldwide, diabetes mellitus affects approximately 100 million people. Roughly 90 to 95 percent of people have Type 2 diabetes and this number is expected to increase due to lifestyle patterns and individuals remaining unaware of their weight. It is becoming more common that vascular diseases are the primary causes of death and disability in people with diabetes (Creager, Luscher, Cosentino, & Beckman, 2003). Those struggling with diabetes also face co-morbidities such as coronary, cerebrovascular, and peripheral artery disease. These types of co-morbidities can cause impairments in the sympathetic nervous system by dysregulation of vascular smooth function; in other words it causes poor circulation within the entire body's system, making it difficult to function properly during certain daily tasks (Creager, Luscher, Cosentino, & Beckman, 2003). These types of co-morbidities are more frequently seen in the elderly population because they are unaware of symptoms that correlate with poor circulation, certain heart conditions, and insufficiency of insulin.

Dysvascular disease. According to Roth, Wiesner, Green, and Wu (1990), dysvascular disease is more commonly known as cardiovascular disease affecting a significant amount of individuals, particularly in the elderly population. Peripheral artery disease and dysvascular disease can be closely associated and display similar symptoms. These two diseases can go hand-in-hand as; peripheral artery disease is associated with a

marked increase in the risk of cardiovascular and cerebrovascular ischemic events (Remes et al., 2008). Peripheral artery disease can be defined as a manifestation of systemic atherosclerosis and is a common circulatory problem in which narrowed arteries reduce blood flow to the limbs (Mayo Clinic, 2013d). When an individual develops peripheral artery disease, it is common the extremities, especially the legs, will not receive enough blood flow to keep up with the demand; thus usually causing leg pain when walking. According to Mayo Clinic (2013d), peripheral artery disease is also likely to be a sign of a more widespread accumulation of fatty deposits within the arteries (atherosclerosis). Peripheral artery disease is a condition that may reduce blood flow to the heart and brain, as well as the legs. Carmona et al. (2005), found peripheral artery disease is by far one of the most common causes for amputations. Their study indicated a total of 229 patients were admitted for an amputation and there were 198 individuals from the sample group exhibited severe peripheral artery disease. Peripheral artery disease is becoming more common in elderly individuals, leading to the consequences of an amputation. It is important to understand how peripheral artery disease can greatly impact an individual's life; therefore, it is important to know and understand strategies to leading a healthier lifestyle such as nutrition and exercise.

Impact of Nutrition

Nutrition is a factor most people struggle with on a daily basis, thus possibly leading to some major health concerns. Nutrition is defined as the process of consuming a variety of food substances and their nutrients, which are then utilized to promote growth, repair, and maintenance of the body (Brookover, 2013). Nutrition is an important aspect of every individual's life because it is needed to provide energy for the body to produce

the actions needed for everyday activities. According to Ohlhorst et al. (2013), proper nutrition can be one of the most effective and least costly ways to decrease a variety of different health diseases and the associated symptoms and risk factors. It also plays a role in decreasing an individual's risk of becoming obese, which may increase the risk of other health complications or co-morbidities such as diabetes, high cholesterol or blood pressure, and heart disease.

Nutritional considerations. In order to maintain a healthy lifestyle, there are special considerations for those who have Type 2 diabetes in relation to nutrition. Eating well is one of life's greatest pleasures and fortunately, having diabetes should not prevent individuals from enjoying a wide range of foods. According to the American Diabetes Association (2013), people with diabetes have the same nutritional needs as the general population, but learning to eat well-balanced meals in the correct amounts, staying active, and taking prescribed medications will allow these individuals to flourish in daily life. It is important to understand individuals can still consume foods they enjoy, but having them in moderation is important to keep in mind. With diabetes, it is also essential to save sweets and desserts for special occasions, but with a little planning individuals can enjoy small portions every once in a while; the same goes for alcohol with sugars in it. There are eight types of foods that will help to manage Type 2 diabetes such as: beans, oatmeal, fish, nonfat yogurt, almonds, non-starchy vegetables, avocados, and egg whites. These food items are intended to help reduce the amount of sugar and simple carbohydrates an individual consumes and increase the intake of more fruits, vegetables, and fiber-rich foods.

In conjunction, there are diet considerations for peripheral artery disease. By following these considerations, blood pressure and weight can more easily be kept under control. General guidelines for heart-healthy diet include: choosing a fiber-rich (whole grains, legumes, nuts) as a main source of carbohydrates, along with a high intake of fresh fruits and vegetables. It is also important to keep the diet low in sodium, calories, cholesterol and fat, and rich in vitamins and minerals (Wiser Health, 2013).

Dietary fiber is the part of food not affected by the body's digestive process. Only a small amount of fiber is metabolized in the stomach and intestine. The rest is passed through the gastrointestinal tract and makes up a part of the stool. There are two types of dietary fiber, soluble and insoluble. Soluble fiber can be found in foods such as oat bran, barley, nuts, seeds, beans, lentils, fruits, peas, strawberries, and many vegetables. Insoluble fiber is found in foods such as whole wheat and whole grain products, vegetables, and wheat bran. Insoluble fiber appears to speed the passage of foods through the stomach and intestines and adds bulk to the stool.

Fiber is very important to a healthy diet and can be a helpful aid in weight management and reduce cholesterol. One of the best sources of fiber comes from legumes, the group of food containing dried peas and beans (Simon, 2012). It is important to avoid saturated fats, found mostly in animal products, and trans-fatty acids which is most commonly found in hydrogenated fats and many commercial baked products and fast-foods. Instead, choose unsaturated fats, particularly omega-3 fatty acids found in vegetable and fish oils. According to Wake Forest Baptist Medical Center (2011), by eating ten grams of soluble fiber with moderate exercise, visceral fat can be reduced by 7.4 percent over a period of time. Based on previous studies, there is evidence

that eating more soluble fiber can decrease visceral body fat, but it has not been determined exactly how it works.

According to the U.S. Department of Health and Human Services (2013), when individuals develop healthy routines and habits with regard to nutrition as well as physical activity, it can decrease the risk of developing serious health conditions. These conditions include: high blood pressure, high cholesterol, diabetes, heart disease, stroke, and cancer. Not only can healthy lifestyles prevent these diseases from occurring, but also manage these conditions to help ensure they do not worsen over time. Therefore, it can be concluded that if elderly individuals develop healthy habits and routines early in life, their risk for sustaining an amputation may be greatly reduced. Unfortunately, most Americans do not participate in a healthy diet or physical exercise, thus impacting their overall health and leading to weight gain (U.S. Department of Health and Human Services, 2013). According to Ohlhorst et al. (2013), when an individual participates in healthy habits of proper nutrition, it can be one of the most effective and cost-efficient ways to preventing and reducing the burden of various diseases, including obesity. Obesity is a growing concern in the American population with an estimated 69.2 percent of American citizens who are considered overweight (National Center for Health Statistics, 2012). This epidemic is also a trend occurring within the amputee population.

Impact of Obesity on Prosthetic Use

Obesity occurs when individuals consume more calories than they expend during daily activities. Therefore, the common causes of obesity are overeating and physical inactivity. Obesity has reached epidemic proportions in the United States within recent years, thus increasing chronic conditions and health complications. Over two-thirds of

adults in America are considered overweight. Issues resulting from excess weight include: insulin resistance, high blood pressure, high cholesterol, stroke, heart disease, cancer, degenerative disease, and sleep apnea. Strategies to rectify obesity issues include developing healthy daily routines and habits such as eating nutritional meals and partaking in physical activity. Another complication due to obesity is the added stress it places on the joints, thus affecting how weight is distributed throughout the body (Medicine Net, 2012).

Implications of weight bearing. Weight bearing is the extent of weight a lower limb is able to bear during standing and walking activities. The inability to bear any weight on the lower limbs can have a profound impact on the individual's ability to participate independently in daily activities. Many individuals who have received a lower limb amputation experience decreased ability to bear weight on their affected limb, thus impacting their stance during standing activities and gait pattern while walking. The type and amount of rehabilitation these individuals undergo after their amputation surgery can influence their weight bearing outcomes (Dickstein, Yoeli, Holtzman, Faust, & Markoviz, 2010).

It is essential these individuals receive proper training and rehabilitative services to gain the most progress in weight bearing on their affected limb; this will also increase their independence in daily life and decrease their fatigue and dependence on assistive devices. Proper weight bearing can also have an effect on the individual's ability to participate in physical fitness exercises, thus affecting their aptitude to appropriately manage weight. The way an individual bears his or her weight throughout the body also affects the type and fit of the prosthetic device an individual can utilize after the

amputation.

Implications of socket fit. According to Kahle and Highsmith (2008), the socket fit is the most important part of any prosthetic device. Having a prosthesis that fits on a consistent basis is the most successful factor assisting with achieving control of the prosthesis, gait stability, and weight bearing characteristics, which all lead to more independence in daily activities. When someone is obese, he or she has more fatty tissue surrounding the muscles, thus impacting the way the socket fits because the muscles are unable to provide a firm foundation for the socket. Bony prominences are also affected by excess fatty tissue, thus limiting the options of prosthetic devices available to obese individuals. For example, prosthetic devices utilizing a suspension system are often not available to obese individuals because extreme discomfort is often experienced due to the inappropriate fit between the affected limb and the socket. Overall, this has a major impact on these individuals' lives and it can affect their independence and interrupt daily routines.

According to Legro et al. (1999), individuals with lower limb amputations have a variety of concerns about the fitting of their prosthetics. The authors utilized the Prosthesis Evaluation Questionnaire and the standard form SF-36 to gather the perspectives of individuals with lower limb amputations with regard to their prosthetics and how these affect their daily lives. Some of the concerns raised by these individuals include fit of the prosthetic, ability to walk with a prosthetic, and skin integrity. These individuals scored lower in all areas except for mental health when compared to individuals without prosthetics, thus showing that quality of life is impacted for those who have prosthetics. In conclusion, the authors found that all individuals agreed that a

proper fitting prosthetic would increase their quality of life immensely. According to Schoppen et al. (2003), elderly individuals who partook in their study still had a low functional level one-year after their amputation and concluded that severe morbidity could have played a role in this result. These authors also found that only 49 percent of the individuals were able to reach effective prosthetic use. The results of these studies help to support the need for a weight management program for these individuals because this would help ensure prosthetics fit on a consistent basis, thus improving independence and quality of life.

Weight reduction and weight management have the potential to increase the likelihood that individuals are fitted with the proper prosthetic device, which can lead to successful rehabilitation. Though weight management is an essential factor in the rehabilitation of the elderly amputee, the energy expenditure associated with daily tasks and physical exercises greatly increases due to the prosthetic. This is why it is very important for this population to participate in physical fitness to increase their capacity for exercise and weight bearing activities (Chin, Sawamura, & Shiba, 2006).

Prosthetic Use and Rehabilitation Services

Further education, treatment, and rehabilitative services will allow these individuals to achieve a higher level of functioning, thus increasing their independence in daily life. Some of the rehabilitative services include: nursing care, occupational therapy, wound care, physical therapy, and working with a nutritionist and prosthetist. There is a need to increase elderly individuals' understanding of the benefits of prosthetic rehabilitation because it is essential since the number of elderly individuals sustaining a lower limb amputation is increasing (Hershkovitz, Dudkiewicz, & Brill, 2013).

According to Resnik and Borgia (2011), individuals who have experienced an amputation will need prosthetic services throughout their entire lifespan and overtime will need to be refitted with a new prosthetic device.

There are a plethora of reasons why individuals may need to be refitted with a new prosthetic including: weight gain or loss, fluid retention, pain, skin break down, or age-related changes. When individuals receive a prosthetic that has been customized to fit them, it can help increase their satisfaction in life, increase their independence in daily activities, and improve their quality of life. Continuous advances in technology and medicine are providing people with more options and better devices that are more comfortable and more functional in daily occupations. These advancements in technology and medicine cannot be utilized when individuals are excessively overweight because it impacts the way prosthetic devices are fitted to the limb.

As previously mentioned, a large percentage of the elderly population is more likely to encounter lower extremity amputations based on their lifestyle. This requires healthcare professionals to focus on this population and work diligently with them to provide proper fitting prosthetics and rehabilitation services. According to Fletcher et al. (2001), a concern for this population is unsuccessful fittings with their prosthetics. The authors found that less than 40 percent of the participants in the study were properly fitted with a prosthetic, thus impacting their ability to participate in physical activities as well as other daily tasks required ambulating with the prosthesis. Therefore, it is important to discover what each individual needs from his or her prosthesis such as how

many hours will they be wearing it each day, what activities they will be performing, and the level of amputation.

Individuals experience unsuccessful fittings of their prosthetic for many reasons including: demonstration of poor skin integrity, acquisition a fixed flexed contracture, requiring another amputation, death due to complications, or simply a lack of a referral. It is important for individuals to receive a proper fitted prosthetic to ensure success in their recovery process with daily tasks. Rehabilitation in mobility occurs after a lower limb amputation and typically focuses on prosthetic training and walking. It is also important to educate and teach these individuals the importance of non-prosthetic mobility skills such as transferring from one surface to another because it enables continued independence in personal and household care (Fortington et al., 2012).

According to recent studies, it is evident the elderly population has a harder time dealing with the after effects of amputations confronting the individual with a magnitude of evolving physical and psychosocial challenges such as functioning physically, changes in employment status or occupation, and alterations in body image and self-concept (Desmond & Maclachlan, 2006). Unfortunately, there is a gap in literature regarding the incorporation of nutrition and exercise training in the rehabilitation process for the elderly population with lower limb amputations. These two factors are extremely important to consider with these individuals because of the positive impact they can have if properly implemented into their daily lives.

According to Hershkovitz, Dudkiewicz, and Brill (2013), prosthetic rehabilitation

improves an individual's ambulation capacity as well as possibly regaining mobility when fitted with a prosthetic. These services can have a major impact in the rehabilitation process and can assist the individual in achieving an optimal quality of life. Therefore, by educating the elderly population about the benefits of prosthetic rehabilitation, it will increase their outcome during the rehabilitation process as well as increase their level of independence. Providing education on the importance of nutrition and fitness and the impact these factors can have on prosthetic use and the recovery process can help to improve the overall rehabilitation process. Proper fitting prosthetic devices and successful rehabilitation can increase an individual's volition to participate in a healthier lifestyle, thus positively impacting daily routines and habits. Individuals should be aware of the positive impact nutrition and fitness can play in daily life with special consideration to prosthetic use in order to enhance performance capacity.

Fitness Considerations

According to Donachy et al. (2004), substantial gains can be made if an individual with an amputation is provided with the appropriate exercise program. In their study, their study subject was a 40-year-old man who had experienced both an upper and a lower extremity amputation. The subject was placed in a training program that was used to increase his ability to participate in life events as well as increase his quality of life. At the conclusion of the study, the subject made significant gains in both cardiovascular fitness and strength, thus enabling him to successfully participate in physical activities. It is important to remain client-centered during the rehabilitation process in order to ensure individuals are successful and since this is a growing concern in the United States, health care professionals need to become more aware of methods that can be used to help these

individuals achieve success. According to Fortington, Rommers, Geertzen, Postema, and Dijkstra (2012), there are other possible solutions to increasing the success rate for those who have sustained a lower limb amputation. Mobility is a one key component to living independently in which it increases an individual's ability to be more engaged in activities of daily living without feeling like are a burden upon others.

Researchers such as Parker, Kirby, Adderson, and Thompson (2010), explore the relationship between measures of ambulation capacity obtained in a clinical setting versus ambulation performance within the community. They were interested in discovering the relationship between what people “can do” (capacity) within a clinical setting versus what people “do do” (performance) within their home environment and community, in relation to ambulation (p.543). Based on the results from the study, many of the capacity measures were moderately correlated to the performance measures. Ambulation was found to be different depending on the location of the amputation as well as the age of the participant in which the amount of steps taken varied. Depression was another factor that led to decreased steps per day in individuals when averaged out.

When analyzing the relationship between a clinical setting and home or community setting, ambulation capacity and performance were relatively similar in which the context did not affect these individuals, but the participants were relatively healthy and active in daily activities. Even though this study indicated that the contexts revealed similar number of steps, it is important to focus on individuals' ability to complete task-oriented activities such as walking within various types of contexts because it may either increase their motivation to do well or hinder their performance. It is crucial to encourage these individuals to practice ambulation with their prosthetic and

develop new ambulation habits in order to increase independence and quality of life.

Chin et al. (2006), justify the importance of investigating the level of physical fitness needed for successful prosthetic ambulation. The results of the study indicate that based on where the level of amputation occurs, this may potentially impact whether or not the individual will be successful in his or her ambulation. For example, the higher on the limb the amputation occurs, the less successful he or she will be with ambulation. A negative factor influencing proper prosthetic fitting is associated with above knee amputations (Fletcher et al., 2001). It is important to remember that everyone's level of fitness needed to ambulate with an amputation will be different, but physical fitness will always be a key factor in successful rehabilitation. When testing physical fitness in individuals with a lower limb amputation, it is important to take all precautions. This is a key factor because they are generally at an increased risk for coronary artery disease due to pre-existing co-morbidities that affect their overall health.

According to Wezenberg, de Haan, van der Woude, and Houdijk (2011), graded exercise testing can be an excellent predictor of how well an individual is able to ambulate, testing all appropriate areas such as balance, strength, endurance, and weight distribution. Exercise has been looked at as an important factor for these individuals because living a sedentary lifestyle can increase a person's chance of other health related problems. An individual who is not in good physical shape generally chooses a sedentary lifestyle because they view exercise in a negative way or think it is hard to complete with a prosthesis. According to Amosun et al. (2005), over 50 percent of their research participants did not complete any physical exercise or activities. The type of ambulatory device used by the participants impacts the frequency of physical exercise people

participated in. Therefore, it is important for therapists or other healthcare professionals to properly train and teach these individuals on how to exercise as well as educate them on the importance of developing healthy routines and habits. This will, in turn, help increase their confidence when partaking in exercise routines. By incorporating and maintaining a healthier lifestyle for individuals with a lower limb amputation, it will in turn increase their perception of their body image.

Associated Complications

The elderly amputee not only experiences difficulties with physical fitness, weight bearing, and weight management due to a newly acquired prosthetic device, but he or she also experience other co-morbidities such as diseases and physiologic deterioration of the body. According to Back-Pettersson and Bjorkelund (2005), various medical co-morbidities can complicate the rehabilitation process for elderly individuals with amputations. It has been shown that these individuals are unable to properly care for themselves in the following areas: wound care, nutrition, physical fitness, and pain and weight management. According to Gailey, Allen, Castles, Kucharik, and Roeder (2008), this population also experiences musculoskeletal imbalances because people with lower limb amputations tend to favor their intact limb versus the limb with the prosthesis, which tends to lead to more stress being placed on the intact joint, thus causing further complications. Other pathologies can result from this added stress include: back pain, degenerative changes, and osteoporosis. Back pain is a common complication that greatly influences individuals' lives because it inhibits their ability to participate in daily tasks. Back pain is most commonly associated with improper and misaligned prostheses because of the incorrect body-positioning individuals use in order to compensate for their

amputation.

According to Amosun et al. (2005), individuals with amputations also have a tendency to increase their intake of tobacco or drug use. Amputations often leave people feeling depressed or experience increased stress, thus affecting the recovery process and increasing the potential of them developing unhealthy habits and routines in order to cope with the sudden change in their lives. Therefore, it can be assumed that these factors will decrease the volitional level within these individuals to participate in weight management activities, including nutritional aspects and physical exercise. Individual volition level may also be impacted by limited of their recently amputated limb. These individuals need to be provided with appropriate education and techniques in order to assist them with developing the necessary routines to carry out a healthy lifestyle, thus improving overall quality of life.

Impact of Amputation on Self-concept

Amputation is an invasive surgery, which can completely transform an individual's body image, thus decreasing a person's confidence level in the way he or she looks. According to Senra, Oliveira, Leal, and Vieira (2011), individual's experienced three phases of self-identity changes overtime such as self-awareness of the impairment, change in self-identity, and the embodiment of a new self-identity of being an amputee. The individual's self-perception of his or her body image is a contributing factor, thus impacting the individual's life. It can affect his or her personality, functioning in daily tasks, sex life, and relationships with others. Therefore, with proper rehabilitation, nutrition and exercise, results from the study suggest that amputees are positively affected in relation to their prosthesis, thus increasing their well-being, satisfaction with

self, and their overall functioning.

The level of volition experienced by this population is also affected, thus impacting their ability to participate in physical activities as well as their satisfaction with life and their prosthetic (Amosun et al., 2005). According to Desmond and Maclachlan (2006), elderly amputees may experience multiple stressors, which may challenge the individual's ability to maintain emotional well-being and may acquire poor coping strategies. Individuals need to utilize proper and effective coping strategies in order to increase their volition level to develop the skills and habits that will lead to an effective lifestyle.

When these individuals struggle with decreased functioning of their affected limb, it more often than not, leads to depression, anxiety, and disengagement in daily life. In a more recent study, it has been observed that individuals who use positive active/task-oriented coping strategies such as problem solving and perceived control over their disability are more likely to have a positive psychosocial adjustment to their situation. Whereas, individuals who are emotionally-focused and use passive strategies such as cognitive disengagement and wishful thinking have been associated with a poor psychosocial adjustment (Desmond & MacLachlan, 2006). Identifying coping strategies early on during their recovery process with help motivate these individuals to participate in a more active lifestyle, thus impacting their overall weight management process.

While it is important to help individuals increase their self-concept and identity, it is also critical to help elderly individuals who have sustained a lower limb amputation identify leisure activities. By having the individual identify various leisure activities, this will help entertain them as well as promote socialization and maintain physical health.

According to Couture, Caron, and Desrosiers (2010), individuals are more likely to engage in passive leisure activities after sustaining a lower limb amputation such as watching television or listening to music because they are easier to be a participant in than active leisure activities. Social activities such as visiting with friends and family are also greatly impacted because they feel helpless. Conversely, a small percentage of individuals wanted to get out of their house and participate in activities outdoors because they did not want to isolate themselves.

By helping individuals explore various types of leisure activities, they will have a greater chance of participating in these activities. Amputees generally think they are disabled and can no longer participate in leisure activities they once were able to do, but if they are educated about the activities they can be involved in, they will be more willing to try these new activities. Increasing the individuals' overall volitional level, helping them to develop productive and healthy habits and routines, assisting them to develop proper coping strategies and weight management behaviors, and identifying appropriate leisure and physical activity routines will all help this population increase satisfaction and quality of life.

Conclusion

After reviewing the literature, it was found that there are various causes for amputations in the elderly population and different factors influencing the outcomes of the rehabilitative process. Studies have been conducted on the effects of physical fitness and weight bearing on the affected limb, the role of diabetes and other diseases, and the individual's self-perception of his or her amputation. However, little research has solely focused on how weight management can impact the elderly amputee on a daily basis.

This gap in literature has provided justification for conducting a study on how weight management can impact functional mobility and independence in daily tasks. The purpose of this project is to explore and develop a weight management resource for the elderly population who has experienced a lower limb amputation. This resource is comprised of both fitness and nutritional manuals, which will help elderly individuals manage their weight to ensure their prosthetic fits properly on a consistent basis.

CHAPTER III

METHODOLOGY

The developed product was a weight management resource, consisting of a nutrition and fitness manual, created to assist occupational therapy clinicians who work with the elderly population with lower limb amputations. The authors hope this product will guide these individuals to live a healthy and successful life after the traumatic experience of an amputation and the corresponding outcomes with associated weight gain. These manuals will not only help to ensure a better fit of the individual's prosthetic device, but also promote individuals to live a healthier lifestyle. Therefore, this will help decrease the amount of time and money spent on re-fitting future prosthetic devices due to potential weight gain. These manuals were not developed to serve as treatment protocols, but solely to educate and promote awareness of the different components of weight management concepts and how the elderly population with lower limb amputations can benefit from lifestyle changes.

An extensive literature review was completed concerning the following topics: amputations, elderly population, weight management, diseases that lead to amputation, physical activity, nutrition, and how these factors affect an individual's quality of life. Through this review it was discovered that amputation is a growing concern within the United States, having a profound impact on individuals and how they function on a daily basis. Also, through personal communication with a professional, the need for a weight management resource was discussed and how it can be beneficial for elderly individuals

living with a lower limb amputation (E.Dias, personal communication, 2013). It is estimated that by the year 2050, lower limb amputations will increase significantly due to many debilitating diseases such as diabetes, dysvascular disease, and peripheral artery disease (Resnik and Borgia, 2011). These diseases are most commonly seen within the elderly population because of the lack of awareness individuals have regarding the signs and symptoms of diabetes, peripheral artery disease, and dysvascular disease. These various debilitating diseases could be prevented through adequate nutritional factors and physical fitness; however, a significant number of individuals are uninformed of the detrimental impact an unhealthy lifestyle can have in conjunction with prosthetic fitting.

Proper nutrition can be one of the most cost-effective ways to decrease these debilitating diseases and their associated symptoms and risk factors. Therefore, education on nutrition is essential to assist all individuals, but especially the elderly population with lower limb amputations. Physical fitness has also been found to be an important factor in helping to properly manage weight, thus increasing the consistent fit of their prosthesis and promote independence in daily activities. According to Irvine (2013), 39 percent of adults' ages 65 or older do not meet the recommendations for physical activity and 33 percent do not participate in any physical activity. These statistics show that many individuals of the elderly population live sedentary lifestyles, thus impacting their overall quality of life.

A sedentary lifestyle and poor nutrition can lead to obesity, which has become a growing concern within the United States. An estimated 69.2 percent of individuals are considered overweight; therefore, leading to other health complications and impacting the fit of a prosthetic device for those with lower limb amputations (National Center for

Health Statistics, 2012). Having a prosthetic device that fits on a consistent basis can help an individual to achieve control of the prosthesis; therefore, leading to more independence in daily activities. After reviewing these research topics, it can be concluded that there is a need for a weight management program for this population and more research may need to be conducted.

Based on the current and historical information gathered from various databases including: CINAHL, PubMed, SCOPUS, and OT Search, an extensive literature review was compiled. The authors realized that developing fitness and nutrition manuals were appropriate for the target population in order to promote awareness about the causes of amputations, the effects of amputations, and how nutrition and physical activity can promote a healthier lifestyle and increase independence for individuals with lower limb amputations.

CHAPTER IV

PRODUCTS

The products developed specifically for this project were a fitness manual and a nutrition manual, which were created to assist occupational therapist clinicians to facilitate weight management in the elderly population who has sustained a lower limb amputation. The fitness manual consists of physical fitness concepts and recommendations, general fitness components, and sample exercises geared toward this population, assisting them to develop and maintain healthy lifestyle routines for proper fit of their prosthesis. Physical concepts and recommendations include: the average amount of exercise an older adult should participate in each week, definitions of aerobic and anaerobic exercises, definition of intensity in relation to exercising, and special considerations for those who have other health conditions such as diabetes, PAD, arthritis, cognitive deficits, and increased fall history. General fitness components include: the important muscle groups, information regarding heart rate and oxygen levels, and the benefits associated with exercising. Finally, sample exercises include: diagrams of stretches elderly individuals can perform before and after exercising, diagrams of exercises targeting each muscle group, as well as a list of other exercises individuals can perform instead of the provided diagrams of exercises.

The nutrition manual is comprised of basic nutritional concepts, what body mass index means and how to calculate it based on age and weight, nutritional

recommendations, the importance of all the food groups, what the colors of the foods mean and how they are beneficial to an individual's health, several sample recipes to help influence healthier habits, and client handouts for patient's to take home. The basic nutritional concepts and recommendations include: the definition of nutrition and body mass index, how calories can affect the body in both a positive and negative way, what each of the food groups mean with special considerations for PAD and Diabetes, suggestions for healthy food substitutions, and the meaning behind the food colors. Some of the sample recipes include: nutritional meals, meals that are simple and quick to make, and recipes with special considerations for those with PAD or diabetes.

The authors developed these manuals separately due to the vast amount of content considered in regard to this specific population and conditions they encounter. It is also important to note that these manuals can be used separately to achieve advantageous results; however, it is recommended these manuals be used in conjunction with each other to ensure the elderly individual gains the most beneficial outcomes. Clinicians will utilize these manuals to support other rehabilitative interventions during the discharge process. This timeframe was chosen specifically to promote implementation of the healthy concepts located within the manuals with the intention of helping elderly individuals integrate healthy habits into their daily life. The authors hypothesized that clients will be able to simplify the information presented from the manuals because they will be educated approximately two weeks before their scheduled discharge date, allowing for better chances to recall information. Implementing the weight management resources into the discharge process is intended to increase generalization of the fitness and nutrition information. At this time it allows the client to ask any questions that may

be confusing to them, giving the clinician the opportunity to clarify any information, as well as demonstrate to the therapist an understanding of the content that has been presented from the manuals. According to Dillingham, Pezzin, MacKenzie, and Burgess (2001), the time from the individual's injury to their first fitting is anywhere from 16 to 24 weeks. Since the authors estimated that individuals utilized their prosthetic device about 80 hours per week, the fitting of the prosthetic needs to be comfortable and satisfying to the individual. This will promote the use of the prosthesis and allow the individual to remain active in their daily life.

The Model of Human Occupation (MOHO) was chosen to help guide the development of this project. According to Turpin and Iwama (2011), the overall focus within MOHO is occupational adaptation, which supports its use with the amputee population due to the vast number of changes associated with losing a limb. The core concepts of this model include environmental impact, volition, habituation, performance capacity, participation, performance, skills, occupational identity, and occupational competence. Once an individual participates in a meaningful occupation, it creates a change in both the occupational identity and occupational competence, thus leading to occupational adaptation in order to promote occupational performance. Meaningful occupations enhance individuals' interest to partake in occupations they find beneficial and rewarding. According to Zimmerer-Branum and Nelson (1994), partaking in occupationally embedded exercises increases the individual's desire to continue with the chosen occupation and has shown to impact their daily lives by implementing activities that are not rote in nature. It is important for individuals to increase their occupational performance in relation to the fitness and nutrition manual concepts. This will increase

their new occupational identity associated with an amputation and enhance competency of how to safely perform occupations; therefore, leading to overall enhancement of quality of life.

Volition, also known as motivation, explains the reasoning behind selecting and participating in specific occupations. The three components within this concept include personal causation, values, and interests. These components can influence or hinder how individuals act, how they experience the action, and the meaning associated with the action. Individuals each hold personal values that influence commitments, occupations, and overall life choices; therefore, it is important to know and understand what cultural values each individual holds to ensure client-centered practice. Another unique aspect of individuals is their preferred interests they find enjoyable and satisfying (Turpin & Iwama, 2011).

Most individuals prefer certain occupations as opposed to others, so therapists need to be cognizant of these interests because it will increase overall volition to participate in therapy interventions and daily occupations. Increased volition may also lead to increased compliance to participate in exercise programs and potentially healthier eating habits. According to Chen, Neufeld, Feely, and Skinner (1999), the findings of their study partially support MOHO as a framework for predicting an individual's compliance with occupational therapy treatment including exercise programs performed within the home. They also found that increased self-efficacy, control, and decreased barriers to performance may lead to increased compliance during treatment.

Allowing individuals to collaboratively select meaningful occupations with the therapist will promote regularity of the occupations, elicit commitment to occupation,

enhance quality of the performance, and foster long-term development of an internal sense of self-efficacy; therefore, the individuals will be more willingly to partake in healthier occupations such as regular physical exercise. For instance, Venable, Hanson, Shechtman, and Dasler (2000), provide an example about a Chinese man who refused to partake in range of motion or strengthening exercises because he did not find the exercises meaningful. When the therapist introduced T'ai Chi to him as an option, he accepted this as a culturally and personally meaningful occupation that he wanted to perform on a daily basis.

According to Burton (1989a), the elderly population experiences multiple challenges within their lives such as loss of friends and family members, decreased income due to retirement, and decreased energy and physical strength due to the aging process. These individuals also experience typical stereotypes associated with the elderly population such as being dependent on others and being socially isolated from the younger generation. All of these challenges have the potential to decrease and individual's volition, personal causation, values, and interests; therefore, leading to less control and meaningfulness in his or her life. It is extremely important to provide elderly clients with opportunities for control in order to increase their volition level to participate in meaningful occupations such as physical exercise or nutritional cooking.

According to Burton (1989a), occupational therapists can provide clients with opportunities for control in order to assist in empowering them in daily life decisions. Therapists can provide clients with the chance to influence their outcome through the use of their actions, provide the clients with enough information so they can help change and predict what may happen to them, and provide them with opportunities to be active

participants in the decision making process. These weight management resources provide clients with opportunities in all of the aforementioned controls because they are able to see how their actions of eating healthy and exercising can have a positive outcome. The manuals provide adequate information that can assist with the implementation of the manual concepts, and allow clients to be active participants in deciding what recipes and exercises they want to perform that will then help lead them to a healthier lifestyle.

The elderly population tends to focus on the past, but it is important for these individuals to focus first on the present and then the future in order to remain healthy (Burton, 1989a). These manuals provide elderly individuals with this opportunity because they are encouraged to focus on the implementation of exercises and healthy eating in the present in order to gain positive outcomes for the future, thus allowing them to compare their health in the present to their health in the past. Not only do these manuals allow individuals to develop value for the present, but they also address the main values that are commonly held by this population. According to Burton (1989a), these values include: independence, social acceptance, adequate resources, ability to cope, and having significant goals. If elderly clients have increased volition to make the commitment to implement these manual concepts into daily life, they have already accomplished establishing significant goals and increased their independence. Exercising and healthy eating can also lead to increased moods, thus leading to their ability to better cope with daily challenges. Individuals also have the opportunity to form exercise groups or cooking classes; therefore, leading to increased social acceptance and social participation. Finally, these manuals provide clients with additional resources to healthy living and thoroughly explain the benefits associated with these manuals.

Volition also incorporates the concept of interests, which is highly important within this population because, often times, elderly persons lose interest in former occupations because of perceived barriers. According to Burton (1989a), it is very important to identify what individuals enjoy doing and the barriers associated with the prevention of accomplishing these enjoyments. Clinicians have the opportunity to work with elderly clients with lower limb amputations and tailor the treatment process specifically to their interests. They also have the opportunity to collaborate with clients in exploring new interests related to healthy habits and routines or removing the barriers that have been preventing them from participating in previous meaningful occupations.

Collaborating with clients during the treatment process is a central component occupational therapists must incorporate into therapy sessions. According to Carlson (1996), client-centered goals and valued activities are closely related to volition, thus potentially leading to increased occupational performance. An important factor clinicians should incorporate into the evaluation process is evaluating how and where the individual receives his or her volition to participate in occupations, which can increase his or her overall compliance to treatment. Not only can including volition within the evaluation process increase a client's outcome, but it can also improve how the therapist relates and responds to the client; therefore, leading to a more effective therapeutic relationship. According to Burton (1989b), elderly individuals are more affected by the quality of the therapeutic relationship compared to younger individuals, thus leading to an increased emphasis on developing an effective and therapeutic relationship in order to ensure better therapy outcomes.

According to Turpin and Iwama (2011), habituation refers to the internalized roles, habits, and routines each individual incorporates into their daily lives. Habits are patterns of behavior, often performed automatically while completing daily tasks. Another important concept identified within MOHO is the idea of internalized roles. Internalized roles contribute to self-identity as well as guiding behavior in accordance to the expectations of others and themselves. Each individual is unique, thus holding different roles leading to identification and participation in various meaningful occupations (Turpin & Iwama, 2011).

Amputations have the potential to interrupt habitual patterns, thus leading to the need to create the new habits identified in the manuals. This provides therapists with the opportunity to establish physical fitness and healthy nutritional habits in the time leading up to discharge in order to promote habituation in weight management and an overall healthier lifestyle. According to Burton (1989a), old age is often characterized by role loss; therefore, it is extremely important to replace these lost roles with new and equally satisfying roles. Examples of these new roles include: Italian cooking classes, cycling classes, or joining a walking group. Hence, it can be hypothesized that amputations can lead to disruptions within individuals' internalized roles; therefore, it can lead to decreased volition and self-concept, which could impact clients' adaptation process and performance capacity.

Not only can an increase in age and an amputation lead to decreased self-concept, thus leading to decreased participation, but obesity also has the potential to impact an individual's self-concept. According to Forhan, Law, Vrkljan, and Taylor (2010), obesity can lead to fear and isolation, thus causing individuals to withdraw from social roles and

responsibilities and avoid environments they find to be intimidating and not obesity friendly. Therefore, it can be hypothesized that losing weight will not only increase health, but also self-concept and self-esteem, thus leading to increased volition to participate in meaningful occupations.

Collaboration between the client and therapist to adapt or develop new internalized roles encompassing the amputation reality in manageable, even empowering perspectives, are critical to increase independence and quality of life. According to Burton (1989a), leisure and social roles become extremely important with the elderly population because they provide companionship and can help increase the meaningfulness of occupations. These manuals can provide these individuals with opportunities to expand their leisure and social roles by participating in group fitness and nutrition groups, thus allowing them to make new friends and participate in new meaningful occupations.

According to Turpin and Iwama (2011), the environment can greatly impact the individual because it incorporates spaces, objects, occupational forms and tasks, and social groups. The properties of the physical space and objects can either facilitate or hinder occupational performance. Social contexts can also greatly influence the way these individuals engage in occupation and how they form values, beliefs, interests, and behaviors (Turpin & Iwama, 2011). According to Burton (1989a), an elderly individual's environment tends to decrease during the aging process because of the loss of friends and family members (social context) and having to relocate to smaller spaces because of their decreased ability to care for a larger home (physical environment). According to Forhan, Law, Vrkljan, and Taylor (2010), participation in daily occupations provides individuals

with the opportunity to interact with others, further develop skills, abilities, and competencies needed for everyday life, and creates purpose within their lives. These manuals assist with all of these factors because they can provide individuals with the opportunity to develop new friendships and participate in meaningful occupations associated with healthy habits and routines such as eating healthier and partaking in physical activity.

According to Forhan, Law, Vrkljan, and Taylor (2010), there are common tensions that individuals who are considered overweight tend to identify during everyday life. These tensions include limited choices of occupations they are able to participate in and a feeling of inadequacy to meet the expectations of other individuals who are also partaking in the occupation. These manuals can help to address these tensions by allowing individuals to meet other individuals who are experiencing the similar situations due to obesity as well as assisting them in losing weight, achieving a healthier lifestyle, and participating in meaningful occupations of their choosing. The authors also identified barriers associated with participating in activities of daily living. These barriers included the environment (participants stated there was usually not enough room to partake in the occupations) and the participants' beliefs of the attitudes other individuals had towards people with obesity (participants felt that other people believed that their increased weight diminished their credibility within society). The fitness and nutritional manuals may assist in alleviating these barriers by providing individuals with obesity with increased confidence with weight loss, thus increasing their ability to participate in a variety of occupations in various environments.

Gaining an understanding of how individuals interact within the contexts of their daily life will help therapists develop more client-centered interventions that will help these individuals establish habits and routines needed for a healthier lifestyle. According to Burton (1989a), objects within the elderly individual's environment become hazardous because of sensory changes, decreased balance, and physical stiffness and mobility problems. Therefore, the impact of these properties will most likely change even more significantly after sustaining an amputation because these individuals have to relearn how to interact within the environment and all of its components due to normal aging changes and the changes associated with an amputation. Better understanding an individual's environment allows occupational therapists to make the exercise and nutrition concepts more individualized, thus leading to better outcomes and increasing the individual's chances of properly adapting to both the aging changes and the changes related to an amputation. Occupational forms and tasks are sequences of action an individual performs in order to complete an occupation (Turpin & Iwama, 2011). After a traumatic experience such as an amputation, an individual must develop new actions to perform daily occupations that once came naturally.

According to Turpin and Iwama (2011), MOHO focuses on the interaction between the person and the environment while participating in meaningful occupations. Therapists must consider how individuals select, organize, and carry out daily occupations and then incorporate these into the intervention plan. Human occupations occur throughout the lifespan, thus emphasizing the impact amputation can have in an individual's life. Individuals spend their whole lives developing and creating their habits, routines, and roles, which give meaning to their life; therefore, when this has been

disrupted by a traumatic event, the recovery process can be extensive. Not only do individuals have to physically recover from an amputation, they also have to recover cognitively, emotionally, and spiritually all while developing new habits, routines, and roles.

According to Burton (1989b), there are many advantages to using MOHO with the elderly population because it can guide therapists to look for the necessary components that influence these individuals occupational behavior. It can also help the therapist determine what is hindering the individual's performance and what their functional deficits are. The Model of Human Occupation provides a more holistic approach and client-centered approach that gains pertinent information about the client. It can also guide therapists to provide rationale for the selected interventions, theoretical base, treatment objectives, and treatment techniques they use with elderly individuals. This model supports the values and beliefs of individuals by taking a holistic approach that is relevant to the elderly population in relation to their physical, emotional, social, and environmental contexts.

CHAPTER V

SUMMARY, CONCLUSION, RECOMMENDATIONS

After reviewing an extensive volume of research, the authors identified the various different causes for amputations within the elderly population. Currently, there are approximately two million people living with an amputation, especially in the lower extremities, within the United States and amputation is becoming a rising concern (Amputation Coalition, 2013). The aging population is more susceptible to debilitating diseases that can cause these individuals to encounter lower limb amputations. The most common debilitating diseases include peripheral artery disease, diabetes, and dysvascular disease. Obesity is another significant concern within our nation directly relating to these debilitating diseases, affecting about 69.2 percent of Americans (National Center for Health Statistics, 2012). Studies have been conducted on the effects of physical fitness in relation to individuals with lower limb amputations, the role of diabetes and other diseases, and the individual's self-perception of his or her amputation; however, there is little research on how weight management can affect the elderly amputee on a daily basis, particularly with prosthesis fitting.

According to U.S. Department of Health and Human Services (2013), when individuals develop healthy routines and habits with regard to nutrition as well as physical activity, it can decrease the risk of developing serious health conditions. Not only can healthy lifestyles prevent these diseases from occurring, but also manage these conditions, ensuring they do not worsen over time. These various debilitating diseases

could be prevented through adequate nutritional factors and physical fitness; however, a significant number of individuals are uninformed of the detrimental impact an unhealthy lifestyle can have. Proper nutrition can be one of the most cost-effective ways to decrease these debilitating diseases and their associated symptoms and risk factors. Therefore, education about the importance of living a healthy lifestyle through daily physical fitness and healthy eating is critical, especially for the elderly population with lower limb amputations. Living a healthier life can increase various aspects of an individual's life in which his or her overall health, self-worth, self-esteem, and the ability to participate in daily activities will increase, as well as the fit of his or her prosthetic will stay consistent, thus enhancing overall quality of life.

Due to the gap in the literature, there is currently no specific weight management resources have been designed to assist elderly individuals with lower limb amputations; therefore, justification has been provided for conducting a pilot study on how weight management resources can increase functional mobility and independence in daily tasks. Hence, the authors conducted extensive research to explore necessary components to develop weight management resources consisting of two manuals; one manual for physical exercise and the other for nutritional guidance. Occupational therapists who work directly with this population will obtain a copy of each manual for personal use and to educate the client during the discharge summary process. On the day of discharge, the therapist will provide the client with the informational handouts from the manuals, assisting the client to integrate the nutritional and fitness concepts into everyday life.

These manuals are intended to increase elderly individuals' healthy habits and routines to lead healthier lifestyles and increasing overall quality of life. These manuals

are also intended to help guide elderly individuals with lower limb amputations manage their weight to ensure their prosthetic fits properly and consistently. The clinical strengths associated with the manuals include basic nutritional and fitness information compiled in one location, thus making it easier for the practicing therapists. The benefits associated with living a healthier lifestyle can prevent further complications and reduce the need for hospitalization. Additionally, the manuals are cost-effective.

Roadblocks that could potentially be encountered include: lack of commitment and dedication by the therapists and clients, misuse of reproduction privilege, lack of interest and volition from clients to change habits and routines needed to promote a healthier lifestyle, and lack of clear communication from the therapists when discussing health benefits associated with weight management. Therefore, it is extremely important for therapists to educate themselves on all the benefits identified within the manuals in order to provide proper education to the clients and to enhance their ability to answer any questions the clients may have. Therapists should demonstrate enthusiasm and dedication to the concepts proposed within the manuals in order to increase the chance clients would be interested and dedicated in developing healthier habits and routines. It is important to incorporate the weight management concepts into a few therapy sessions prior to discharge to increase the likelihood that clients understand exactly what the benefits are. Finally, it is important for therapists to remain ethical and professional when producing copies for clients at discharge.

Product outcomes will be measured through the subjective experiences of the individuals with lower limb amputations and by the consistent fit of the prosthetic device. It is recommended that therapists follow up with the clients at three, six, nine, and twelve

months post-discharge to inquire about the progress being made with weight management and to help clarify any information that may be confusing to the client. A consistent and proper fit of the prosthetic device also helps to measure the product's usefulness; otherwise, if the device is ill-fitting, it will not be used effectively or efficiently to its full potential. Research has shown that when an individual has achieved a consistent weight through weight management, their prosthetic device fits better and there is decreased need to be continually fitted with a new prosthetic device.

There were various limitations associated with this product. One limitation was the lack of research available specifically regarding weight management in the elderly population with lower limb amputations and the benefits it can have. Subjective experiences gained from individuals within this identified population were not included in this project, which may have provided more meaning and justification to the development of the manuals. Concepts within these manuals may be difficult to generalize to the entire population due to various factors including: the level of the amputation, socioeconomic status, and access to resources needed in order to develop healthy habits and routines. Due to time restrictions, the authors were not able to achieve a longitudinal effect, thus potentially impacting the end products. Other limitations include possible bias due to increased interest in the specific population and the recommended exercises and recipes within the manuals were not trialed to evaluate effectiveness.

A pilot study should be conducted concerning the effects of a weight management program in relation to eating a balanced diet and increased physical exercise. It would be interesting to see these manuals implemented as a preventative measure with individuals

who have not already sustained an amputation. It is recommended various marketing strategies be developed that will help increase awareness among the general elderly population, educating them about the benefits of healthy eating and regular physical exercise. Based on the findings from the research, more studies need to be performed specifically on weight management and how it directly benefits the elderly population who has sustained a lower limb amputation. This will help to increase their awareness of how to reduce and possibly prevent the risk of developing debilitating diseases that could potentially lead to an amputation.

Potential scholarly collaboration among occupational therapists, physical therapists, nutritionists, prosthetists, and other relevant team members regarding a weight management program would be beneficial for this population to ensure healthcare professionals have common goals for their clients. Through collaboration, it will allow team members' to combine their knowledge base, in regard to scopes of practice, to work effectively and efficiently with their target population, ensuring they are enhancing clients' quality of life. This will be especially beneficial if addressed from initial contact with the clients until the conclusion of therapy. For example, physical therapists may be working specifically on ambulation rehabilitation and how to functionally use a prosthetic device; while occupational therapists work with the individuals to increase independence in activities of daily living and educating them on the importance of weight management. The therapists and the other team members could then compare the progress being made based on the clients' performance after the weight management program has been implemented for a period of time.

APPENDICES



Nutrition Manual

A Guide to a Healthier You

Lauren Battles, Maia Sobolik, and Breann Lamborn, MPA

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Introduction

We are pleased to provide this manual to occupational therapy practitioners in order to assist elderly individuals who have experienced a lower limb amputation in implementing nutritional aspects into their daily lives. This manual was created in order to help these individuals to not only live a healthier lifestyle, but also to assist them in managing their weight to ensure their prosthesis fits correctly on a more consistent basis.

As extensive review of the literature was conducted in order to investigate the hardships these specific individuals face on a daily basis. It was discovered that many elderly individuals are concerned with the proper fitting of their prosthetic device. It was also discovered that these individuals tend to live a more sedentary lifestyle when compared to other individuals with lower limb amputations. This provided the incentive to create a nutritional manual specifically for the elderly population who has sustained a lower limb amputation. This manual will guide and assist these individuals to adequately manage their weight, encourage healthy habitual patterns, and to promote overall satisfaction and quality of life.

A companion fitness manual was also created in order to assist the elderly population with becoming more active and managing their weight. This fitness manual can be found at the conclusion of this nutrition manual.

Manual Concepts

This document includes the following sections:

Nutrition:

What is it? Why is it important? How do you maintain a healthy diet?

Body Mass Index:

What is it? What can it tell you?

Calories:

What are they? How many should you consume in a day?

Food Groups:

What are they? What are the basic concepts? How much of each food group should you consume?

Food Colors:

What do the different colors of food mean?

Water:

How much water should you drink a day? Why is it important?

Sample Recipes:

What are some examples of nutritious meals? Are there any healthy substitutes for certain ingredients?

Additional Resources:

Where can you find more information regarding these topics?

References:

Where did this information come from?

Client Handouts:

What do clients need to take home with them to be successful?

Nutrition

Nutrition is defined as the process of consuming a variety of food substances and their nutrients, which are then utilized to promote growth, repair, and maintenance of the body (Brookover, 2013). Nutrition is an important aspect of every individual's life because it is needed in order to provide energy for the body to produce the actions needed for everyday activities.

It is also important to take in the proper nutrients in order for the body to produce the most effective and efficient energy. Maintaining a balanced diet through healthy eating can provide an individual with: vitality and energy needed for daily tasks, maintain a healthy weight, boost the immune system, improve performance in daily occupations, delay the effects of aging, increase activeness and fitness, prevent fatigue, protect teeth and gums, increase the ability to concentrate and alter mood, and prevent serious illnesses (Case Western Reserve University, 2013).

According to Ohlhorst (2013), proper nutrition can be one of the most effective and least costly ways to decrease a variety of health diseases and their associated symptoms and risk factors. It also plays a role in decreasing an individual's risk of becoming obese, which can also decrease the risk of other complications or co-morbidities such as diabetes, high cholesterol or blood pressure, and heart disease.

Nutrition is a very essential aspect to daily life and everyone should consider the impact it can have on his or her body, mind, and spirit. Eating healthy meals and consuming the proper nutrients should be a habit that every individual should develop, especially the elderly population who has sustained a lower limb amputation. These individuals should make conscious decisions to make nutritional meals a part of his or her daily routine and eventually making it habitual.

Body Mass Index

The Body Mass Index (BMI) is a measurement for the human body shape based on an individual's height and weight. BMI provides a fairly reliable indicator of body thickness, in relation to fat, for most people and is used to screen for weight categories that may lead to health problems. BMI does not measure body fat directly, but does correlate with direct measures of body fat; however, it is not a diagnostic tool (Centers for Disease Control and Prevention, 2013).

Studies have shown that weight increases to reach levels of being overweight or obese which increases an individual's risk of other health conditions. By increasing one's BMI, health conditions such as coronary heart disease, type 2 diabetes, cancers (endometrial, breast, and colon), hypertension, stroke, and liver and gallbladder disease, to name a few, can be detrimental. However, to determine if excess weight is a health risk, a healthcare provider would need to perform further assessments. These assessments might include skinfold thickness measurements, evaluations of diet, physical activity, family history, and other appropriate health screenings (Centers for Disease Control and Prevention, 2013).

Being overweight is defined as having a BMI of 25 or higher and obesity is defined as a BMI of 30 or higher.

Formula: $\text{weight (kg)} / [\text{height (m)}]^2$ or $\text{weight (lb)} / [\text{height (in)}]^2$

The standard weight status categories associated with BMI ranges for adults:

BMI	Weight Status
Below 18.5	Underweight
18.5-24.9	Normal
25.0-29.9	Overweight
30.0 and above	Obese

Fig. 1

Center for Disease Control & Prevention. (2013). About BMI for adults. Retrieved from http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html. Reprinted with permission.

*Please note that the BMI does not take into account the weight of muscle mass. These are general guidelines to help ensure you stay within the normal limits of the BMI.

It is important to remember, however, that BMI is not a direct measure of body thickness and that BMI is calculated from an individual's weight which includes both muscle and fat. As a result, some individuals may have a high BMI but not have a high percentage of body fat. For example, highly trained athletes may have a high BMI because of increased muscularity rather than increased fat within the body. Although some people with a BMI in the overweight range (from 25.0 to 29.9) may not have excess body fatness, most people with a BMI in the obese range (equal to or greater than 30) will have increased levels of fat within the body.

It is also important to remember that weight is only one factor related to risk for disease. If you have questions or concerns about the appropriateness of your weight, you should discuss them with your healthcare provider (Center for Disease Control and Prevention, 2013).

Calories

A calorie is a unit measurement of energy that a person obtains from different foods. A person needs to consume the right amount of calories every day in order to have enough energy to participate in his or her daily habits and routines. Consuming too many calories and not partaking in physical activities to burn these excess calories can lead to weight gain because the calories are stored as fat within the body. Obesity is a major concern because it can lead to unhealthy side effects such as fatigue, limited mobility, and it can make it harder to breathe and sleep (Perry, 2011). On the other hand, consuming too few calories can result in the body going into starvation mode, which can lead to further complications. These complications include: malnutrition, decreased metabolism, heart problems, and digestive problems (Vaesa, 2013).

The amount of calories someone should consume each day depends on several different factors such as age, height, gender, lifestyle, and overall health (Medical New Today, 2013). According to ChooseMyPlate.gov (2013), the average male 51 years or older should take in 2,000 calories every day whereas the average woman 51 years or older should consume 1,600 calories. It is important for people to consume the right amount of calories every day in order to live a healthy and balanced life. It is especially important for elderly individuals to understand the difficulty of burning calories. For the elderly population, it is difficult to burn these calories as an individual's ages and especially for those who have sustained a lower limb amputation. Therefore, it is important to help the elderly population understand how to manage their calories with the use of a routine that helps them stay conscientious of the foods they are eating. According to Han, Tajar, and Lean (2011), weight management through calorie consumption and expenditure is an essential component for elderly individuals. These are important considerations for individuals with lower limb amputations, especially if their activity level has decreased. This is especially important to understand because as mentioned before, consuming too many calories can lead to weight gain, thus affecting the fit of your prosthetic.

In simpler terms, you gain weight when you take in more calories than you burn. Eating and drinking too many calories – especially when you're not exercising enough often lead to weight gain. Before you start a diet, set a realistic weight loss goal. There are 3,500 calories in a pound. To lose a

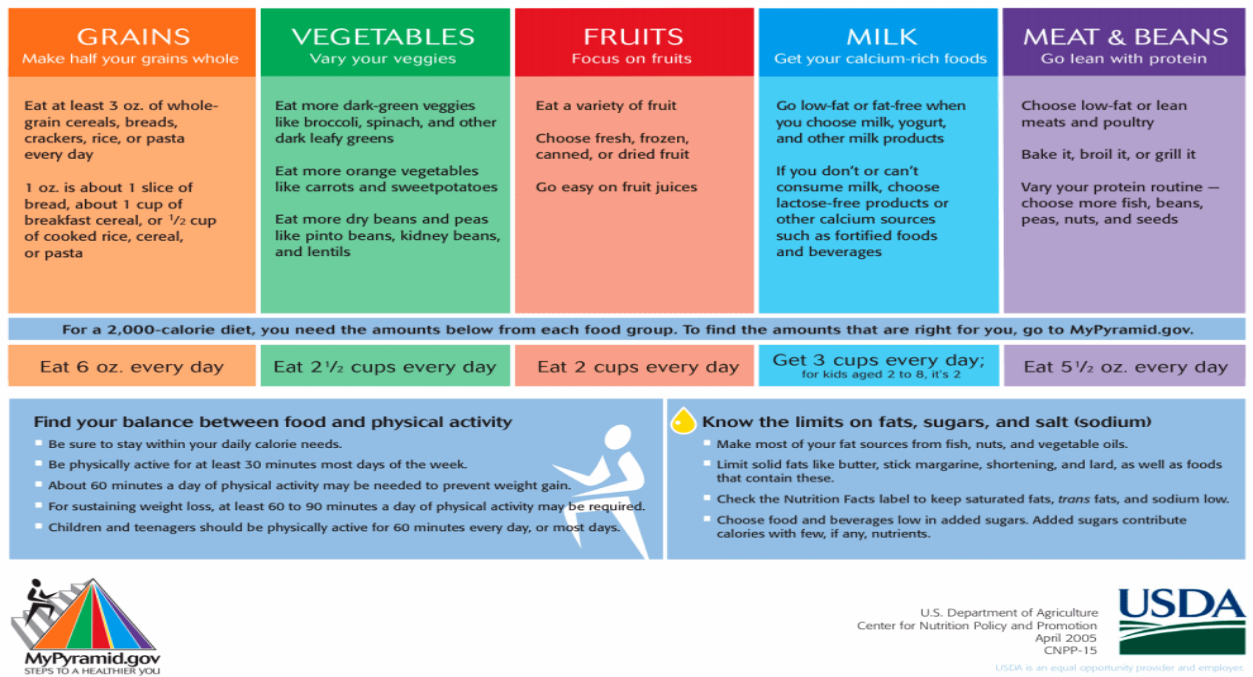
pound a week, you need to reduce 3,500 calories from your weekly calorie intake. For example, if you currently eat 2,000 calories per day, cutting back to 1,500 per day will save you 3,500 calories per week.

There are many possible ways to easily reduce your caloric intake. For example, substitute red meat with lean meat, fish or poultry; eat grilled vegetables as a side dish instead of mashed potatoes. Trade whole milk for low-fat or fat-free milk, drink diet soda instead of regular soda, and switch to whole wheat bread instead of white bread.

If you don't feel that you can reduce your calorie intake on your own, ask your health care provider or a nutritionist to help you plan a healthy diet (Wiser Health, 2013).

Food Groups





Figs. 2 & 3
<http://fnic.nal.usda.gov/dietary-guidance/myplatefood-pyramid-resources>

There are five major food groups people need to consider when preparing healthy meals. These food groups include: vegetables, fruits, grains, dairy, and protein. The following information was gathered from ChooseMyPlate.gov (2013).

Vegetables: Eating vegetables are an important aspect of a healthy diet. Vegetables contain low amounts of fat and calories and a variety of nutrients such as vitamin A, vitamin C, and potassium. People who consume enough vegetables every day tend to have a reduced risk of select chronic diseases such as heart attack, stroke, obesity, Type 2 diabetes, and certain types of cancer. It is recommended that half of an individual's plate should be dedicated to fruits and vegetables. There are five subgroups within the vegetable category, which include: dark green vegetables, starchy vegetables, red and orange vegetables, beans and peas, and other vegetables. Some examples of these vegetables are as follows:

Dark Green Vegetables: broccoli, kale, spinach, turnip greens, dark green leafy lettuce, and romaine lettuce.

Starchy Vegetables: corn, green peas, green lima beans, green bananas, water chestnuts, and potatoes.

Red and Orange Vegetables: carrots, pumpkin, tomatoes, sweet potatoes, red peppers, and squash.

Beans and Peas: black beans, black-eyed peas, garbanzo beans, kidney beans, navy beans, pinto beans, soy beans, and split peas.

Other Vegetables: artichoke, asparagus, avocado, bean sprouts, beets, Brussels sprouts, cabbage, cauliflower, celery, cucumbers, eggplant, green beans, green peppers, iceberg lettuce, mushrooms, okra, onions, turnips, and zucchini.

Fruits: Many of the same concepts discussed under the vegetable category are true with fruits as well. Fruits can help individuals maintain a healthy and balanced diet as well as contribute to overall increased health. They too can help reduce the risk of certain types of chronic diseases. Fruits contain many different nutrients such as dietary fiber, folic acid, and vitamin C. They are naturally low in fat, sodium, and calories and do not contain any cholesterol. As mentioned early, an individual's plate should be half fruits and vegetables. Some examples of commonly eaten fruits include: apples, bananas, cherries, grapefruit, grapes, kiwi, oranges, pears, plums, pineapple, prunes, strawberries, blueberries, raspberries, watermelon, and cantaloupe.

Eating More Fruits and Vegetables

Fruits and vegetables are essential for a healthy heart. Not only do they contain vitamins, minerals and antioxidants, but they also have fiber, which helps flush extra cholesterol and fats from your body. Fruits and vegetables also usually contain few calories and no fat (or only "good" fats, such as in an avocado), so they fill you up without putting on pounds. In addition, fresh fruits and vegetables also are low in sodium (salt). The AHA recommends eating four to five cups of fruits and vegetables – fresh, frozen, canned or dried – each day in a variety of colors and types. When buying canned vegetables or fruit, be sure to choose ones without added sauce, fat, sugars or salt (Wiser Health, 2013).

Grains: As mentioned with other food groups, grains, especially whole grains, can also lead to improved health quality. Whole grains contain dietary fiber, several B vitamins, and minerals, which may help reduce the risk of heart disease and constipation. Eating whole grains may also help with overall weight management. Grains are divided into two subgroups, which are whole grains and refined grains. It is recommended that individuals should make at least half of their grains whole grains.

Whole Grains: whole-wheat flour, bulgur, oatmeal, whole oatmeal, and brown rice.

Refined Grains: white flour, de-germed cornmeal, white bread, and white rice.

Eating Fewer Carbohydrates

All carbohydrates break down into sugar in your blood, but some do it more quickly or powerfully than others. Some of this sugar is turned into energy; the rest is converted into fat and stored for later use. Reducing the amount of carbohydrates you eat lowers your insulin levels and causes your body to burn stored fat for energy, ultimately resulting in weight loss (Wiser Health, 2013).

On a low-carb diet, you'll eat a lot of protein, such as lean meat, poultry, fish, eggs and some non-starchy vegetables. Some low-carb plans allow you to eat fruits, whole grains and vegetables. A typical low-carb diet restricts your daily carbohydrate intake to 50 to 150 grams. However, cutting out carbs entirely is rarely effective for long-term weight loss (Wiser Health, 2013).

Instead, opt for healthy carbohydrates such as whole grain bread and pasta, brown rice, quinoa, oats, and other fiber-rich grains. Also, choose low-sugar (or low-carb) fruits, such as strawberries, blackberries, raspberries, rhubarb, cranberries, grapefruit, melon, plums and peaches (Wiser Health, 2013).

Protein: There are a variety of foods within the protein food group including: meat, poultry, fish, eggs, nuts, and seeds, which are all essential for health and maintenance of the body. Proteins are used for a variety of different functions within the body such as enhancing the components in bones, muscles, cartilage, skin, and blood. It is recommended that individuals consume at least eight ounces of cooked seafood every week.

Dairy: Improved bone health is one major health benefit associated with consuming the appropriate amount of dairy. Important nutrients one can receive from dairy products include: calcium, potassium, vitamin D, and protein. Calcium is important for building bones and teeth as well as maintaining bone mass and healthy blood pressure. It is recommended that individuals choose fat-free or low-fat (1%) dairy products because other

dairy products contain saturated fats and cholesterol can lead to health complications.

Eating Less Sugar

Added sugars are empty calories. They do little to fill you up and can slowly pack on the pounds. In addition, foods with added sugar, like cookies, candy and other sweets, tend to be higher in calories and fat. Reducing the amount of added sugars in your diet can have a significant heart-healthy benefit.

According to the AHA, Americans consume 22 teaspoons of sugar each day. The AHA recommends that women shouldn't get more six teaspoons a day; the recommended limit for men is nine teaspoons.

To start cutting back on sugar, check out the labels on packaged foods. Ingredients such as sugar, corn syrup, fructose, dextrose, molasses or evaporated cane juice are added sugars. Other ways to reduce sugar include buying fresh fruit or fruit canned in water or natural juice, adding fresh fruit to cereal instead of sugar, buying sugar-free beverages or sweets, trying artificial sweeteners (e.g., NutriSweet, Splenda), or using natural calorie-free sweeteners (Wiser Health, 2013).

Eating Less Fat

It's essential for us to eat some fat. However, not all fats are created equal, and our bodies respond to them differently. In addition, how much fat you eat is critical to heart health. Experts suggest that fats should make up only 25% to 35% of your calories. Fewer than 7% of your calories should come from saturated fats, such as those found in butter, meat and other animal products. The majority of the calories you eat from fats should come from healthy monounsaturated and polyunsaturated fats, found in foods such as nuts and some cooking oils (e.g., olive, canola).

Kitchen fats, including lard, shortening, butter, hard margarine and some cooking oils, are loaded with saturated fats and calories. Limiting the amount of fat or oil you use in cooking will cut down on the amount of fat in your diet. It is recommended that you cook with oils that have unsaturated fat, such as canola oil, olive oil and safflower. You should also avoid trans-fats, which are fats that are artificially changed to stay solid at room temperature. They don't exist naturally in any foods. Our bodies treat them like saturated fats, meaning they raise LDL ("bad") cholesterol and triglyceride levels. Limit trans-fat to less than 1% of your total daily calories.

Cut back on processed foods, commercially fried and baked goods, fried fast food, and butter. These foods tend to be high in saturated and trans-fats as well as cholesterol (Wiser Health, 2013).

Eating Less Salt

Salt has been found to raise blood pressure, which could increase the risk of heart attack and stroke. If you have high blood pressure or have been diagnosed with a heart condition, your doctor may encourage you to adopt a low-salt (sodium) diet.

The recommended daily limit for sodium is 2,100 mg for normal, healthy adults, but if you have high blood pressure, diabetes, or chronic heart failure, the recommended intake is 1,500 mg a day. As an example, one teaspoon of table salt has 2,325 milligrams (mg) of sodium. This may mean reducing the amount of processed foods you eat, which are typically very high in salt. Read nutrition labels on everything you buy – some products (such as salad dressing or baked goods) contain surprisingly high levels of sodium.

Avoid adding salt to your food when you're cooking and eating. Swap salt for spices and herbs to add flavor; fresh lemon juice can also enhance flavor. Eat fresh fruits and vegetables whenever possible. Sodium does naturally occur in some foods, such as cheese and milk. So if you're counting milligrams, be sure to include these in your daily limit (Wiser Health, 2013). Therefore, by reducing the amount of sodium you consume on a daily basis, this can increase your overall health and quality of life, especially in the elderly population with lower limb amputations. Sodium can often cause people to bloat, which will in turn affect the fit of the prosthetic.

Eating Whole foods

The term “whole” is often confused with organic, but whole foods aren't necessarily organic, nor are organic foods necessarily whole. Organic foods typically refers to how the food is grown, while whole refers to how the food is processed or refined before it's eaten. Whole foods are less processed than conventional foods. “Processed” means that a food has been changed from its natural state. Flour and sugar that is bleached and stripped of its natural nutrients and fiber are examples of processed foods.

As a result, processed foods often contain little nutrition but are high in fat and sugar. Because they lack fiber, they don't fill you up, and they offer none of the natural compounds, such as vitamins and antioxidants, which

help keep you healthy. Examples of whole foods include whole grains, whole-wheat flours and whole sugars, such as fresh fruit. When you eat whole foods, you're generally eating foods in their natural state with all the vitamins, fiber, minerals and other nutrients that are typically found in food.

The extra fat and calories in processed foods can lead to weight gain. By consuming more whole foods, it may help you maintain or lose weight and reduce the risk of heart disease and stroke. Although whole foods may not be free of fat or sugars or have fewer calories, they are typically healthier for you (Wiser Health, 2013).

It is suggested that the elderly population who has sustained a lower limb amputation should pay close attention to these particular recommendations because it can help lead to a healthier lifestyle. By consuming more whole foods, fruits, and vegetables and reducing intake of sugar, salt, fatty foods, and eating fewer carbohydrates, it has been discovered that symptoms of certain diseases or conditions can be reduced and possibly reversed. It is important to follow these guidelines and eventually becoming habitual in everyday life because it will ensure a better fit of your prosthetic as well as enhancement in quality of life.

Special Considerations

The two main causes associated with lower limb amputations in the elderly individual include diabetes and peripheral arterial disease. The following are special considerations for these diseases in regards to nutrition and a heart healthy diet.

Diabetes

Eating well is one of life's greatest pleasures and fortunately, having diabetes does not prevent you from enjoying a wide range of foods. According to the American Diabetes Association (2013), people with diabetes have the same nutritional needs as anyone else, but learning to eat well-balanced meals in the correct amounts, staying active, and taking prescribed medications will allow you to flourish in daily life. It is important to understand that you can still eat foods you enjoy, but having them in moderation is a critical factor. With diabetes, it's also important to save sweets and desserts for special occasions, but with a little planning you can enjoy small portions every once in a while; the same goes for Alcohol with sugars in it. There are eight types of foods that will help manage Type 2 Diabetes and they include beans, oatmeal, fish, nonfat yogurt, almonds, non-starchy vegetables, avocados, and egg whites.

Beans are a healthy way of combining a high-quality carbohydrate, lean protein, and soluble fiber that helps stabilize the body's blood sugar levels and helps prolong hunger. Beans are also inexpensive, versatile, and virtually fat-free. It is important to keep blood sugar levels regular by choosing high-quality carbohydrates over low-quality carbohydrates such as refined grains and sugary foods because it keeps blood sugar levels stable. Also, it is important to pair these carbohydrates with protein and/or healthy fat, whenever possible because it too helps the regulation of sugar levels.

Oatmeal is considered rich in whole grains and is a high-fiber food. By eating oatmeal, it may reduce the risk of diabetes by 35 to 42 percent. Oatmeal is an excellent source of soluble fiber, which slows the absorption of glucose from food within the stomach, keeping those blood sugar levels under control. It is suggested to place 1 to 2 tablespoons of nuts such as pecans, almonds, or walnuts on top of oatmeal. These nuts will add protein and healthy fat which will further stabilize those sugars. Plus, the nuts add great crunch and flavor to your morning meal.

Fish is another outstanding source of lean protein. Types of fish include catfish, cod, or tilapia, to name a few, are all mild-flavored, white-fleshed fish that can be prepared healthfully by baking, grilling, or roasting. It is suggested to pair fish with high-quality carbohydrates such as vegetables, lentils, or beans for a balanced meal combination that will help keep blood sugars from rising. Wild Salmon for the Omega-3 will reduce the chances of heart disease

Nonfat Yogurt is fat-free and naturally contains both high-quality carbohydrates and protein, making it an excellent food for slowing and/or preventing an unhealthy rise in blood sugar level. Diets that are high in calcium, such as consuming yogurt or other calcium-rich foods, are typically associated with a reduced risk of Type 2 diabetes.

Almonds, especially unsalted, provide a healthy, low-carb mix of monounsaturated fats plus magnesium, which is believed to be instrumental in carbohydrate metabolism. Harvard University conducted a study that found if an individual consumed an increased daily intake of magnesium; it reduced the risk of developing diabetes by 33 percent. Therefore, including more magnesium-rich foods like almonds, pumpkin seeds, spinach, and Swiss chard in your diet is highly recommended.

Non-starchy Vegetables include items such as broccoli, spinach, mushrooms, and peppers. These food items are full of vitamins, minerals, and fiber and are an ideal source of high-quality carbohydrates. Since these vegetables are low in calories, nutrient-dense, and have a low-impact on blood sugar levels. These are a crucial component to planning a nutritional diet plan for diabetes. For most individuals, this is one food group that is okay to eat a lot of.

Avocados are high in monounsaturated fats, which are generally considered among the healthiest of fats. Researchers have found that a diet high in monounsaturated fats and low in low-quality carbs may improve insulin sensitivity. Monounsaturated fats may also improve heart health which is an especially important benefit for diabetics, who are at an increased risk for heart disease and stroke. Add a few thin slices of avocado to your sandwiches in place of mayonnaise, or mash a ripe avocado with cilantro, lime juice, and diced tomatoes for a delicious guacamole dip.

Egg Whites are rich in high-quality lean protein and low in carbohydrates. Egg whites are another source of protein that controls or prevents Type 2 diabetes. One large egg white contains about 16 calories and 4 g of high-quality, filling protein, making egg whites a perfect food for blood sugar control, not to mention weight-loss or maintenance (Joy Bauer Food Cure, 2013).

Peripheral Arterial Disease and Dysvascular Disease

Any diet should keep blood pressure and weight under control. General guidelines for heart-healthy diet include: choosing a fiber-rich (whole grains, legumes, nuts) as a main source of carbohydrates, along with a high intake of fresh fruits and vegetables. It is also important to keep your diet low in sodium, calories, cholesterol and fat, and rich in vitamins and minerals (Wiser Health, 2013). Soluble fiber can be found in foods such as oat bran, barley, nuts, seeds, beans, lentils, fruits (citrus apples), peas, strawberries and many vegetables. Insoluble fiber is found in foods such as whole wheat and whole grain products, vegetables and wheat bran. Insoluble fiber appears to speed the passage of foods through the stomach and intestines and adds bulk to the stool (Simon, 2012).

Dietary fiber is the part of food that is not affected by the body's digestive process. Only a small amount of fiber is metabolized in the stomach and intestine. The rest is passed through the gastrointestinal tract and makes up a part of the stool. There are two types of dietary fiber, soluble and insoluble. Fiber is very important to a healthy diet and can be a helpful aid in weight management. One of the best sources of fiber comes from legumes, the group of food containing dried peas and beans (Simon, 2012).

It is important to avoid saturated fats (found mostly in animal products) and trans-fatty acids (found in hydrogenated fats and many commercial baked products and fast-foods). Instead, choose unsaturated fats (particularly omega-3 fatty acids found in vegetable and fish oils) (Vascular Disease Foundation, 2013).

Food Colors

RED: The red found in tomatoes and strawberries helps reduce the risk of heart disease, prostate cancer, and other types of cancers. Contain nutrients such as lycopene, ellagic acid, Quercetin, and Hesperidin, to name a few. These nutrients reduce the risk of prostate cancer, lower blood pressure, reduce tumor growth and LDL cholesterol levels, scavenge harmful free-radicals, and support joint tissue in arthritis cases.

YELLOW and ORANGE: The yellow found in corn and banana squash protects against macular degeneration, the number-one cause of blindness in the elderly.

The orange found in carrots, oranges and sweet potatoes helps prevent heart disease by lowering cholesterol and helps reduce the risk of stroke. Contain beta-carotene, zeaxanthin, flavonoids, lycopene, potassium, and vitamin C. These nutrients reduce age-related macular degeneration and the risk of prostate cancer, lower LDL cholesterol and blood pressure, promote collagen formation and healthy joints, fight harmful free radicals, encourage alkaline balance, and work with magnesium and calcium to build healthy bones.

GREEN: The green found in dark, leafy greens such as kale and spinach help prevent cancer. Green vegetables contain chlorophyll, fiber, lutein, zeaxanthin, calcium, folate, vitamin C, calcium, and Beta-carotene. The nutrients found in these vegetables reduce cancer risks, lower blood pressure and LDL cholesterol levels, normalize digestion time, support retinal health and vision, fight harmful free-radicals, and boost immune system activity.

BLUE and PURPLE: The blue in blueberries helps protect memory and motor function as you age, and helps fight cancer and heart disease. The purple in Concord grapes and grape juice helps prevent heart disease. Blue and purple foods contain nutrients such as: lutein, zeaxanthin, resveratrol, vitamin C, fiber, flavonoids, ellagic acid, and quercetin. Similar to the previous nutrients, these nutrients support retinal health, lower LDL cholesterol, boost immune system activity, support healthy digestion, improve calcium and other mineral absorption, fight inflammation, reduce tumor growth, act as an anticarcinogens in the digestive tract, and limit the activity of cancer cells.

WHITE: Contain nutrients such as beta-glucans, EGCG, SDG, and lignans that provide powerful immune boosting activity. These nutrients also activate natural killer B and T cells, reduce the risk of colon, breast, and prostate cancers, and balance hormone levels, reducing the risk of hormone-related cancers.

Green	White	Red	Yellow/Orange	Blue/Purple
Artichokes	Bananas	Beets	Apricots	Blueberries
Asparagus	Cauliflower	Cherries	Butternut Squash	Blackberries
Avocados	Dates	Cranberries	Cantaloupe	Plums
Broccoli	Garlic	Papaya	Carrots	Grapes
Brussel sprouts	Ginger	Pink/Red Grapefruit	Lemons	Prunes
Celery	Jicama	Radishes	Mangoes	Eggplant
Cabbage	Mushrooms	Raspberries	Nectarines	Pomegranates
Green Apples	Onions	Red Bell Peppers	Peaches	Purple Cabbage
Green Pears	Potatoes	Red Grapes	Pumpkin	Purple Figs
Green Grapes	Turnips	Red Apples	Sweet Potatoes	Purple Carrots

Fig. 4
(Disabled World Towards Tomorrow, 2013)

Disabled World Towards Tomorrow. (2013). Color wheel of fruits and vegetables. Retrieved from <http://www.disabled-world.com/artment/publish/fruits-vegetables.shtml>. Reprinted with permission.

Water

According to the Mayo Clinic (2013), water is an essential component to promoting and maintaining a healthy lifestyle, yet needs and consumption vary depending on the individual. Water is a principle component to individuals making up about 60 percent of one's body weight. Every system within our body requires and depends on water because it either flushing out toxins, carrying nutrients to cells, and/or provides a moist environment for the ear, nose, and throat tissues. By not consuming enough water in a day, it can lead to dehydration, which generally limits the body from functioning properly. Even a mild form of dehydration can drain an individual's energy and cause tiredness.

What is the average intake of water should a person consume? The amount varies depending on the individual's lifestyle, climate they live in, and the quality of the water that is being consumed. Based on information given from the Institution of Medicine, an adequate water intake for men is about 3 liters or about 13 cups a day and for the women it's about 2.2 liters or 9 cups daily. In the past, it has been recommended that a person should drink eight 8-ounce glasses of water a day, but it has recently been confirmed that this should be the minimum of what a person should consume (Mayo Clinic, 2013). Therefore, it is critical to be drinking water throughout the day because it keeps the body hydrated and increases performance in activities that require a lot of energy. If you engage in activities that make you sweat then it is necessary to consume more water to compensate for the fluid loss that has been expended. Drinking water all throughout the day should become a habitual component to your everyday life decrease the risks of becoming dehydrated.

Consequently, dehydration is a serious concern, especially within the elderly population. It is important to stay aware of ways to prevent dehydration, recognize signs, and treat promptly. Sudden shifts in the body's water balance can frequently result in dehydration. Dehydration is often a consequence of not consuming enough water throughout the day, but can also stem from other reasons as well. Other factors of dehydration may include, diarrhea, excessive sweating, loss of blood, side effects prescribed medication like diuretics, and diseases such as diabetes. As we age, we become less aware of thirst as well as gradually lowers our ability to regulate our body fluid balance. As we age, we lose water (Parentgiving, 2013). A

few symptoms of dehydration may include dry or sticky mouth, sleepiness or tiredness, thirst, decreased urine output, few or no tears when crying, dry skin, headache, constipation, and dizziness or lightheadedness (Mayo Clinic, 2013).

Sample Recipes

*These recipes were obtained from the Food Network

Light Chicken Caesar Salad

Total Time: 30 minutes

4 cups cubed day old crusty bread
2 tablespoons extra-virgin olive oil
½ cup nonfat plain Greek yogurt
1 cup shredded parmesan cheese
1 small clove garlic
Juice of 1 lemon
1 teaspoon Dijon mustard
1 pound boneless, skinless chicken breasts
2 romaine lettuce hearts, chopped
Freshly ground pepper
Kosher salt

Directions:

Make the croutons: Preheat the oven to 350 degrees F. Toss the bread cubes in a large bowl with 1 tablespoon olive oil. Spread on a baking sheet and bake until crisp, tossing halfway through, about 20 minutes.

Meanwhile, make the dressing: Puree the yogurt, 2 tablespoons parmesan, the garlic, anchovies, lemon juice, mustard and 2 tablespoons water in a mini food processor or blender.

Pound the chicken between 2 pieces of plastic wrap with a heavy skillet until ½ inch thick. Brush a rimmed baking sheet with the remaining 1 tablespoon olive oil. Add the chicken and season with salt. Brush evenly with 1 tablespoon of the dressing and sprinkle with 2 tablespoons parmesan. Broil, undisturbed, until golden brown and cooked through, about 5 minutes.

Transfer to a cutting board and thinly slice.

Toss the lettuce, croutons, and the remaining dressing and ¾ cup parmesan in a large bowl. Divide the salad among bowls, top with chicken and season with pepper (optional).

Per serving: Calories: 368; Total Fat: 15 grams; Saturated Fat: 4 grams; Protein: 37 grams; Total carbohydrates: 21 grams; Sodium: 534 milligrams

Garlic Chicken and Potatoes

Total Time: 40 minutes

- 2 pounds small red-skinned potatoes, quartered
- 3 tablespoons extra-virgin olive oil
- ½ teaspoon cumin seeds
- Kosher salt (optional) and freshly ground pepper
- 4 cloves of garlic, finely chopped
- 2 tablespoons packed light brown sugar
- 1 lemon (1/2 juiced, ½ cut into wedges)
- Pinch of red pepper flakes
- 4 skinless, boneless chicken breasts (1 ½ to 1 ¾ pounds)
- 2 tablespoons chopped fresh cilantro or parsley

Directions:

Position a rack in the lower third of the oven and preheat to 425 degrees F. Toss the potatoes with 1 tablespoon olive oil, the cumin seeds, ¾ teaspoon salt (optional), and pepper to taste. Spread in a large baking dish and roast until the potatoes begin to brown; 25 to 30 minutes.

Meanwhile, heat the remaining 2 tablespoons olive oil in a small skillet over medium heat. Add the garlic and cook, stirring frequently, until lightly golden, about 2 minutes. Remove from the heat and stir in the brown sugar, lemon juice and red pepper flakes.

Remove the baking dish from the oven, put the potatoes to the sides and arrange the chicken breasts in the middle. Season the chicken with salt and drizzle with the garlic mixture. Return to the oven and bake until the chicken is cooked through and the potatoes are tender, about 20 minutes. Remove from the oven; transfer the chicken to a cutting board and slice. Add the cilantro to the baking dish and toss with potatoes. Serve the chicken with the potatoes and lemon wedges. Drizzle with the pan juices.

Per serving: Calories: 474; Total Fat: 15 grams; Saturated Fat: 3 grams; Protein: 39 grams; Total carbohydrates: 45 grams; Sodium: 601 milligrams

Tuscan Vegetable Soup

Total Time: 35 minutes

1 (15-ounce) can low-sodium cannellini beans, drained and rinsed
1 tablespoon olive oil
1/2 large onion, diced (about 1 cup)
2 carrots, diced (about 1/2 cup)
2 stalks celery, diced, (about 1/2 cup)
1 small zucchini, diced (about 1 1/2 cups)
1 clove garlic, minced
1 tablespoon chopped fresh thyme leaves (or 1 teaspoon dried)
2 teaspoons chopped fresh sage leaves (or 1/2 teaspoon dried)
1/2 teaspoon salt
1/4 teaspoon freshly ground black pepper
32 ounces low-sodium chicken broth or vegetable broth
1 (14.5-ounce) can no salt added diced tomatoes
2 cups chopped baby spinach leaves
1/3 cup freshly grated Parmesan, optional

Directions

In a small bowl mash half of the beans with a masher or the back of a spoon, and set aside.

Heat the oil in a large soup pot over medium-high heat. Add the onion, carrots, celery, zucchini, garlic, thyme, sage, 1/2 teaspoon of salt and 1/4 teaspoon of pepper, and cook stirring occasionally until the vegetables are tender, about 5 minutes.

Add the broth and tomatoes with the juice and bring to a boil. Add the mashed and whole beans and the spinach leaves and cook until the spinach is wilted, about 3 minutes more.

Serve topped with Parmesan, if desired.

Breakfast Burritos

Vegetable cooking spray

2 egg whites

2 whole wheat tortillas

¼ cup fat-free cheese

¼ cup rinsed canned beans (pinto or black beans)

Salsa (to taste)

Directions

1. Spray vegetable cooking spray into a frying pan
2. Scramble the egg whites in the pan and cook to the desired degree of doneness
3. Place the cooked eggs on the tortillas
4. Sprinkle the cheese over the eggs
5. Place the beans over the cheese and eggs
6. Roll each tortilla into a wrap
7. Microwave for 30 seconds
8. Spoon salsa on top

Per serving:

Calories: 282

Total Fat: 3.6 grams

Saturated Fat: 1.5 grams

Protein: 23 grams

Total carbohydrates: 50 grams

Sodium: 833 milligrams

Sample Recipes for Diabetes and PAD

*Recipes were gathered from the American Diabetes Association

Dill and Feta Turkey Burgers

Serves: 4; Serving Size: 1

burger

1 pound extra-lean ground turkey breast
1 tablespoon Dijon mustard
1/2 cup fresh dill, finely chopped
1/4 tablespoon kosher salt
Freshly ground pepper, to taste
1 tablespoon extra-virgin olive oil
2 ounces crumbled low fat feta cheese
4 (2 ounces) fresh bakery whole-wheat buns

Preparation

1. Preheat oven to 425°F.
2. Combine turkey, mustard, dill, salt, and pepper in a large bowl. Stir to combine. Divide the meat into four equal portions, and form into patties.
3. Heat oil in a large oven-proof skillet over medium heat. Add burgers, saute for 2-3 minutes per side or until brown. Transfer to the oven, and cook for 15 minutes or until cooked through. Top with feta cheese, and cook for another 5 minutes or until cheese is melted. Serve on buns with a salad.

Nutrition Information

Calories: 335
Total Fat: 9 g
Saturated Fat: 2.4 g
Cholesterol: 60 mg
Sodium: 710 mg
Total Carbohydrate: 9 g
Protein: 36 g
Fiber: 4 g

Food Exchanges: 4 Lean Meat, 2 Starch

Chili Lime Shrimp

Prep Time: 5 min; **Serves:** 4

1 tsp olive oil
nonstick cooking spray
4 scallions (green and white parts), minced
1/4 cup lime juice
1 Tbsp minced garlic
1 Tbsp Splenda Brown Sugar Blend
1 tsp Asian-style chili-garlic sauce
9 ounces peeled and deveined raw medium shrimp

Preparation

1. Add olive oil and a generous amount of cooking spray to a nonstick skillet over medium-high heat.
2. Add scallions and sauté for 3-4 minutes.
3. In a small bowl, whisk together lime juice, garlic, brown sugar, and chili-garlic sauce. Pour over scallions and simmer until reduced by half, about 3–4 minutes.
4. Add shrimp and sauté until shrimp is pink and just cooked through, about 4 minutes.

Nutrition Information

Exchanges/Choices	Cholesterol 105 mg
1/2 Carbohydrate 2 Lean Meat	Sodium 570 mg
	Potassium 195 mg
Calories 100	Total Carbohydrate 6 g
Calories from Fat 20	Dietary Fiber 0 g
Total Fat 2.0 g	Sugars 2 g
Saturated Fat 0.4 g	Protein 14 g
Trans Fat 0.0 g	Phosphorus 150 mg

Chef's Tip: You should be able to find the chili-garlic sauce in the ethnic foods aisle of the grocery store.

Chicken Tenders and Spicy Tomato and Black Beans

Serves: 4

12 (about 1 1/4 lb) chicken tenders

1/2 tsp chili powder

1 10-oz can mild diced tomatoes and green chilies

1/2 15.5-oz can no-salt-added black beans, rinsed and drained

2 tsp extra virgin olive oil

1/2 cup fat-free sour cream

Serving size: 3 ounces cooked chicken, 1/2 cup bean mixture, and 2 tablespoons sour cream

Preparation

1. Sprinkle both sides of the chicken pieces evenly with chili powder.
2. Place a large nonstick skillet over medium-high heat until hot. Coat skillet with cooking spray, cook chicken 2 minutes or until browned on one side, turn, and top with the tomatoes and beans. Bring to a boil (over medium-high heat), and cook for 3 minutes or until chicken is no longer pink in the center.
3. Remove from heat and drizzle the oil evenly over all. Serve in shallow soup bowls, topped with sour cream.

Nutritional Information

Exchanges/Choices

1/2 Starch

1/2 Carbohydrate

4 Lean Meat

Calories: 265

Calories from Fat: 55

Total Fat: 6 g

Saturated Fat: 1.5 g

Trans Fat: 0 g

Cholesterol: 85 mg

Sodium: 405 mg

Total Carbohydrate: 16 g

Dietary Fiber: 3 g

Sugars: 4 g

Protein: 35 g

Some tips for this meal:

- The canned tomatoes and green chili's act as a "multi-tasker". There are multiple flavors and seasoning agents in one container.
- Economical dish because there are few ingredients and saves time in the kitchen and in clean up...and shopping.
- Great served over brown rice or whole grain pasta (1/2 cup per serving)

Healthy Food Substitutions

If your recipe calls for this ingredient:	Try substituting this ingredient:
Bacon	Canadian bacon, turkey bacon, smoked turkey or lean prosciutto (Italian ham)
Bread, white	Whole-grain bread
Bread crumbs, dry	Rolled oats or crushed bran cereal
Butter, margarine, shortening or oil in baked goods	Applesauce or prune puree for half of the called-for butter, shortening or oil; butter spreads or shortenings specially formulated for baking that don't have trans fats Note: To avoid dense, soggy or flat baked goods, don't substitute oil for butter or shortening. Also don't substitute diet, whipped or tub-style margarine for regular margarine.
Butter, margarine, shortening or oil to prevent sticking	Cooking spray or nonstick pans
Cream	Fat-free half-and-half, evaporated skim milk
Cream cheese, full fat	Fat-free or low-fat cream cheese, Neufchatel, or low-fat cottage cheese pureed until smooth
Eggs	Two egg whites or 1/4 cup egg substitute for each whole egg
Flour, all-purpose (plain)	Whole-wheat flour for half of the called-for all-purpose flour in baked goods Note: Whole-wheat pastry flour is less dense and works well in softer products like cakes and muffins.
Fruit canned in heavy syrup	Fruit canned in its own juices or in water, or fresh fruit

Ground beef	Extra-lean or lean ground beef, chicken or turkey breast (make sure no poultry skin has been added to the product)
Lettuce, iceberg	Arugula, chicory, collard greens, dandelion greens, kale, mustard greens, spinach or watercress
Mayonnaise	Reduced-calorie mayonnaise-type salad dressing or reduced-calorie, reduced-fat mayonnaise
Meat as the main ingredient	Three times as many vegetables as the meat on pizzas or in casseroles, soups and stews
Milk, evaporated	Evaporated skim milk
Milk, whole	Reduced-fat or fat-free milk
Oil-based marinades	Wine, balsamic vinegar, fruit juice or fat-free broth
Pasta, enriched (white)	Whole-wheat pasta
Rice, white	Brown rice, wild rice, bulgur or pearl barley
Salad dressing	Fat-free or reduced-calorie dressing or flavored vinegars
Seasoning salt, such as garlic salt, celery salt or onion salt	Herb-only seasonings, such as garlic powder, celery seed or onion flakes, or use finely chopped herbs or garlic, celery or onions
Soups, creamed	Fat-free milk-based soups, mashed potato flakes, or pureed carrots, potatoes or tofu for thickening agents
Soups, sauces, dressings, crackers, or canned meat, fish or vegetables	Low-sodium or reduced-sodium versions
Sour cream, full fat	Fat-free or low-fat sour cream, plain fat-free or low-fat yogurt
Soy sauce	Sweet-and-sour sauce, hot mustard sauce or low-sodium soy sauce

Sugar	In most baked goods you can reduce the amount of sugar by one-half; intensify sweetness by adding vanilla, nutmeg or cinnamon
Syrup	Pureed fruit, such as applesauce, or low-calorie, sugar-free syrup
Table salt	Herbs, spices, citrus juices (lemon, lime, orange), rice vinegar, salt-free seasoning mixes or herb blends
Yogurt, fruit-flavored	Plain yogurt with fresh fruit slices

Fig. 5

(Center for Disease Control and Prevention, 2013).

Additional Resources

Center for Disease Control and Prevention:

<http://www.cdc.gov/search.do?queryText=nutrition&action=search&searchButton.x=0&searchButton.y=0>

Choose My Plate: www.choosemyplate.gov

Food Network: www.foodnetwork.com/recipes/food-networkkitchens/

Mayo Clinic: www.mayoclinic.com/health/healthy-recipes/NU00585

Nutrition Data: <http://nutritiondata.self.com/>

United States Department of Agriculture (USDA):

<http://www.usda.gov/wps/portal/usda/usdahome>

American Diabetes Association's Magic Menus for People with Diabetes, 2nd Ed.: <http://www.diabetes.org/>



Client Handouts

Nutrition

- Consumption of a variety of foods and their nutrients which help promote your growth, repair, and maintenance of the body.
- Provides energy for your body to produce the actions needed for your everyday activities
- Maintaining a balanced diet through healthy eating can provide you with:
 - Energy needed for daily activities
 - Maintain a healthy weight
 - Boost your Immune system
 - Improve performance in daily occupations
 - Delay effects of aging
 - Increase activeness and fitness
 - Prevent fatigue
 - Protect teeth and gums
 - Increase ability to concentrate and alter mood swings
 - Prevent serious illnesses
- Through proper nutrition, it can be one of the most effective and least costly ways to decrease your chance of developing associated health diseases and risk factors
- Nutrition is essential to living a healthy and active life from day to day and can impact your mind, body, and spirit.

Body Mass Index (BMI)

- Provides a fairly reliable indicator of body fat based on height and weight
- Used to help screen for weight categories that may lead to health problems
- Increasing your BMI can lead to:
 - Coronary heart disease
 - Type 2 disease
 - Cancers (Endometrial, Breast, & Colon)
 - Hypertension

- Stroke
- Liver and gallbladder disease
- Can be used with other assessments to determine if your excess weight is a health risk
- Being overweight is defined as having a BMI of 25 or higher and obesity is defined as a BMI of 30 or higher.
- The standard weight status categories associated with BMI ranges for adults:

BMI	Weight Status
Below 18.5	Underweight
18.5-24.9	Normal
25.0-29.9	Overweight
30.0 and above	Obese

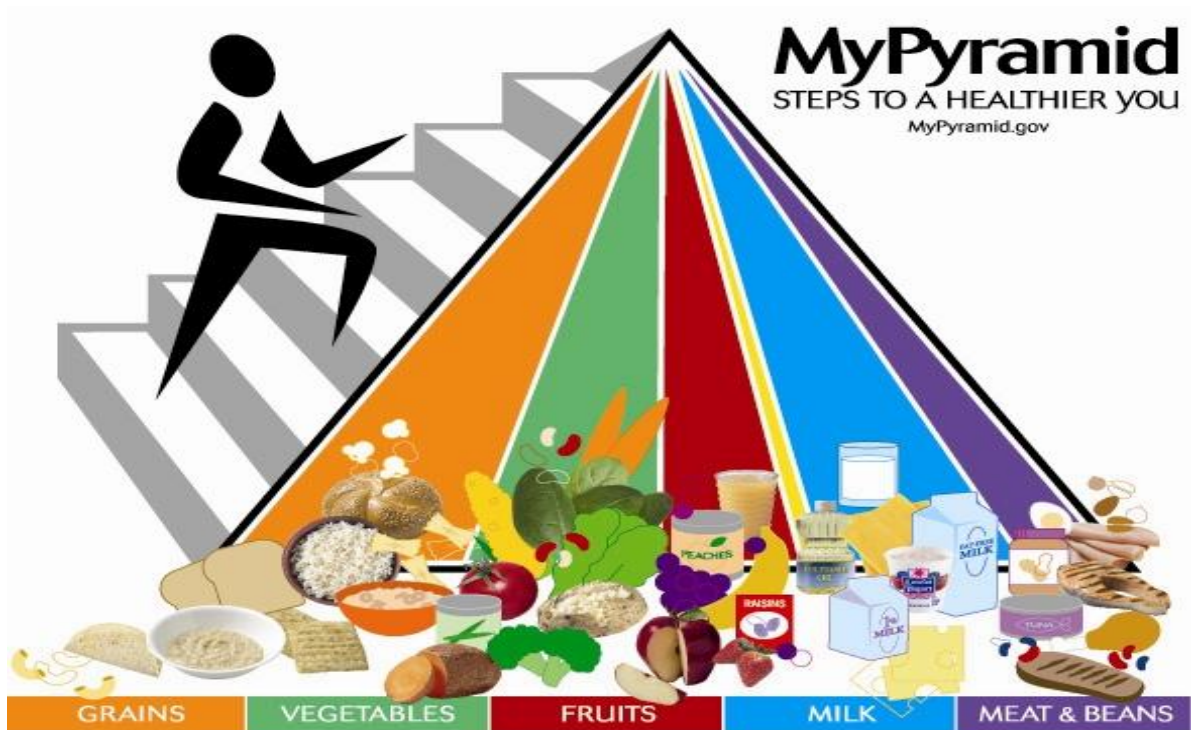
- *Please note that the BMI does not take into account the weight of muscle mass. These are general guidelines to help ensure you stay within the normal limits of the BMI.
- It is important to keep in mind that you may have a high BMI, but not have a high percentage of body fat. Please consult with your doctor for further assessment.

Calories

- It is important for you to consume the correct amount of calories every day in order to maintain enough energy needed to participate in daily tasks.
- By consuming too many calories and not maintaining an active lifestyle, it can lead to weight gain because the calories are stored as fat within the body
- Obesity is a major concern because it can lead to unhealthy side effects such as:
 - Increased fatigue
 - Limited Mobility
 - Cause breathing problems and sleep disturbances

- The amount of calories you should consume is based on a variety of factors such as:
 - Age
 - Height
 - Gender
 - Lifestyle
 - Overall health
- With age, your ability to burn calories decreases due to the decrease in your metabolism; especially for amputees
- There are many possible ways to reduce your caloric intake such as:
 - Substitute red meat with lean meat, fish, or poultry
 - Eat grilled vegetables instead of mashed potatoes
 - Trade whole milk with low-fat or fat-free milk
 - Switch to whole wheat bread instead of white bread

Food Groups



GRAINS Make half your grains whole	VEGETABLES Vary your veggies	FRUITS Focus on fruits	MILK Get your calcium-rich foods	MEAT & BEANS Go lean with protein
<p>Eat at least 3 oz. of whole-grain cereals, breads, crackers, rice, or pasta every day</p> <p>1 oz. is about 1 slice of bread, about 1 cup of breakfast cereal, or ½ cup of cooked rice, cereal, or pasta</p>	<p>Eat more dark-green veggies like broccoli, spinach, and other dark leafy greens</p> <p>Eat more orange vegetables like carrots and sweetpotatoes</p> <p>Eat more dry beans and peas like pinto beans, kidney beans, and lentils</p>	<p>Eat a variety of fruit</p> <p>Choose fresh, frozen, canned, or dried fruit</p> <p>Go easy on fruit juices</p>	<p>Go low-fat or fat-free when you choose milk, yogurt, and other milk products</p> <p>If you don't or can't consume milk, choose lactose-free products or other calcium sources such as fortified foods and beverages</p>	<p>Choose low-fat or lean meats and poultry</p> <p>Bake it, broil it, or grill it</p> <p>Vary your protein routine – choose more fish, beans, peas, nuts, and seeds</p>
<p>For a 2,000-calorie diet, you need the amounts below from each food group. To find the amounts that are right for you, go to MyPyramid.gov.</p>				
Eat 6 oz. every day	Eat 2½ cups every day	Eat 2 cups every day	Get 3 cups every day; <small>for kids aged 2 to 8, it's 2</small>	Eat 5½ oz. every day
<p>Find your balance between food and physical activity</p> <ul style="list-style-type: none"> Be sure to stay within your daily calorie needs. Be physically active for at least 30 minutes most days of the week. About 60 minutes a day of physical activity may be needed to prevent weight gain. For sustaining weight loss, at least 60 to 90 minutes a day of physical activity may be required. Children and teenagers should be physically active for 60 minutes every day, or most days. 		<p>Know the limits on fats, sugars, and salt (sodium)</p> <ul style="list-style-type: none"> Make most of your fat sources from fish, nuts, and vegetable oils. Limit solid fats like butter, stick margarine, shortening, and lard, as well as foods that contain these. Check the Nutrition Facts label to keep saturated fats, <i>trans</i> fats, and sodium low. Choose food and beverages low in added sugars. Added sugars contribute calories with few, if any, nutrients. 		



- Vegetables
 - Important aspect of a healthy diet
 - Provide many nutrients such as :
 - Vitamin C
 - Vitamin A
 - Potassium
 - Reduce risk of chronic diseases such as:
 - Heart attack
 - Stroke
 - Obesity
 - Type 2 diabetes
 - Certain types of cancer
 - 5 types of vegetables
 - Dark Green Vegetables
 - Starchy Vegetables
 - Red and Orange Vegetables
 - Beans and Peas
 - Other Vegetables

- Fruits
 - Same effects as vegetables
 - Can help you to maintain a healthy and balanced diet as well increase overall health
 - Can help to reduce the risk of certain types of chronic diseases
 - Fruits contain dietary fiber, folic acid, and Vitamin C
- Grains
 - Whole grains contain dietary fiber, Vitamin B, and minerals which help reduce risk of heart disease and constipation
 - Helps with your overall weight management
 - 2 groups
 - Whole Grains
 - Whole-wheat flour, oatmeal, whole oatmeal, brown rice
 - Refined Grains
 - White flour, de-germed cornmeal, white bread, white rice
 - Helps to increase your energy level by providing the necessary nutrients
- Protein
 - Includes:
 - Meat
 - Poultry
 - Fish
 - Eggs
 - Nuts
 - Seeds
 - Used for a variety of functions:
 - Enhancing the components in bones
 - Muscles
 - Cartilage
 - Skin
 - Blood

- Dairy
 - Improves your bone health by making them stronger
 - Includes a variety of nutrients:
 - Calcium
 - Potassium
 - Vitamin D
 - Protein

Special Considerations

- Diabetes
 - Eat well balanced meals, in moderation
 - Stay active
 - Take all prescribed medications
 - Eat a variety of foods such as:
 - Beans
 - Oatmeal
 - Fish
 - Nonfat Yogurt
 - Almonds
 - Non-starchy vegetables
 - Avocados
 - Egg whites
- Peripheral artery disease and dysvascular
 - Choosing a fiber rich diet with whole grains, legumes, nuts
 - Keep your diet low in sodium, calories, cholesterol, and fat; therefore, eat:
 - Oat bran
 - Barley
 - Nuts
 - Seeds
 - Beans
 - Lentils
 - Fruits
 - Peas

- Avoid saturated fats and trans-fatty acids

Food Colors

Green	White	Red	Yellow/Orange	Blue/Purple
Artichokes	Bananas	Beets	Apricots	Blueberries
Asparagus	Cauliflower	Cherries	Butternut Squash	Blackberries
Avocados	Dates	Cranberries	Cantaloupe	Plums
Broccoli	Garlic	Papaya	Carrots	Grapes
Brussel sprouts	Ginger	Pink/Red Grapefruit	Lemons	Prunes
Celery	Jicama	Radishes	Mangoes	Eggplant
Cabbage	Mushrooms	Raspberries	Nectarines	Pomegranates
Green Apples	Onions	Red Bell Peppers	Peaches	Purple Cabbage
Green Pears	Potatoes	Red Grapes	Pumpkin	Purple Figs
Green Grapes	Turnips	Red Apples	Sweet Potatoes	Purple Carrots

- Red
 - Helps to reduce risk of heart disease, prostate cancer, and other cancers
 - Lower Blood Pressure
 - Reduce tumor growth and bad cholesterol levels
- Green
 - Dark, leafy greens such as kale and spinach help prevent cancer
 - Help reduce
 - Cancer risks
 - Lower blood pressure
 - Reduce bad cholesterol levels
 - Normalize digestion
 - Support retinal health and vision
 - Boost immune system activity

- White
 - Boosts your immune system
 - Nutrients also activate:
 - Killer B and T cells
 - Reduce the risk of colon
 - Breast cancer
 - Prostate cancer
- Yellow/Orange
 - Protects against macular degeneration
 - Lowers cholesterol and helps reduce the risk of stroke
 - Contains calcium to build healthy bones
 - Contains
 - Betacarotene
 - Zeaxanthin
 - Flavonoids
 - Lycopene
 - Potassium
 - Vitamin C
- Blue/Purple
 - Help to protect your memory and motor function as you age
 - Helps you fight cancer and heart disease
 - Contains many nutrients such as:
 - Lutein
 - Vitamin C
 - Fiber
 - Flavonoids
 - Support a healthy digestion
 - Limits the activity of cancer cells

Sample Recipes

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Light Chicken Caesar Salad

Total Time: 30 minutes

4 cups cubed day old crusty bread
2 tablespoons extra-virgin olive oil
½ cup nonfat plain Greek yogurt
1 cup shredded parmesan cheese
1 small clove garlic
Juice of 1 lemon
1 teaspoon Dijon mustard
1 pound boneless, skinless chicken breasts
2 romaine lettuce hearts, chopped
Freshly ground pepper
Kosher salt

Directions:

Make the croutons: Preheat the oven to 350 degrees F. Toss the bread cubes in a large bowl with 1 tablespoon olive oil. Spread on a baking sheet and bake until crisp, tossing halfway through, about 20 minutes.

Meanwhile, make the dressing: Puree the yogurt, 2 tablespoons parmesan, the garlic, anchovies, lemon juice, mustard and 2 tablespoons water in a mini food processor or blender.

Pound the chicken between 2 pieces of plastic wrap with a heavy skillet until ½ inch thick. Brush a rimmed baking sheet with the remaining 1 tablespoon olive oil. Add the chicken and season with salt. Brush evenly with 1 tablespoon of the dressing and sprinkle with 2 tablespoons parmesan. Broil, undisturbed, until golden brown and cooked through, about 5 minutes.

Transfer to a cutting board and thinly slice.

Toss the lettuce, croutons, and the remaining dressing and ¾ cup parmesan in a large bowl. Divide the salad among bowls, top with chicken and season with pepper (optional).

Per serving: Calories: 368; Total Fat: 15 grams; Saturated Fat: 4 grams; Protein: 37 grams; Total carbohydrates: 21 grams; Sodium: 534 milligrams

Garlic Chicken and Potatoes

Total Time: 40 minutes

2 pounds small red-skinned potatoes, quartered
3 tablespoons extra-virgin olive oil
½ teaspoon cumin seeds
Kosher salt (optional) and freshly ground pepper
4 cloves of garlic, finely chopped
2 tablespoons packed light brown sugar
1 lemon (1/2 juiced, ½ cut into wedges)
Pinch of red pepper flakes
4 skinless, boneless chicken breasts (1 ½ to 1 ¾ pounds)
2 tablespoons chopped fresh cilantro or parsley

Directions:

Position a rack in the lower third of the oven and preheat to 425 degrees F. Toss the potatoes with 1 tablespoon olive oil, the cumin seeds, ¾ teaspoon salt (optional), and pepper to taste. Spread in a large baking dish and roast until the potatoes begin to brown; 25 to 30 minutes.

Meanwhile, heat the remaining 2 tablespoons olive oil in a small skillet over medium heat. Add the garlic and cook, stirring frequently, until lightly golden, about 2 minutes. Remove from the heat and stir in the brown sugar, lemon juice and red pepper flakes.

Remove the baking dish from the oven, put the potatoes to the sides and arrange the chicken breasts in the middle. Season the chicken with salt and drizzle with the garlic mixture. Return to the oven and bake until the chicken is cooked through and the potatoes are tender, about 20 minutes. Remove from the oven; transfer the chicken to a cutting board and slice. Add the cilantro to the baking dish and toss with potatoes. Serve the chicken with the potatoes and lemon wedges. Drizzle with the pan juices.

Per serving: Calories: 474; Total Fat: 15 grams; Saturated Fat: 3 grams; Protein: 39 grams; Total carbohydrates: 45 grams; Sodium: 601 milligrams

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Total Time: 35 minutes

1 (15-ounce) can low-sodium cannellini beans, drained and rinsed
1 tablespoon olive oil
1/2 large onion, diced (about 1 cup)
2 carrots, diced (about 1/2 cup)
2 stalks celery, diced, (about 1/2 cup)
1 small zucchini, diced (about 1 1/2 cups)
1 clove garlic, minced
1 tablespoon chopped fresh thyme leaves (or 1 teaspoon dried)
2 teaspoons chopped fresh sage leaves (or 1/2 teaspoon dried)
1/2 teaspoon salt
1/4 teaspoon freshly ground black pepper
32 ounces low-sodium chicken broth or vegetable broth
1 (14.5-ounce) can no salt added diced tomatoes
2 cups chopped baby spinach leaves
1/3 cup freshly grated Parmesan, optional

Directions

In a small bowl mash half of the beans with a masher or the back of a spoon, and set aside.

Heat the oil in a large soup pot over medium-high heat. Add the onion, carrots, celery, zucchini, garlic, thyme, sage, 1/2 teaspoon of salt and 1/4 teaspoon of pepper, and cook stirring occasionally until the vegetables are tender, about 5 minutes.

Add the broth and tomatoes with the juice and bring to a boil. Add the mashed and whole beans and the spinach leaves and cook until the spinach is wilted, about 3 minutes more.

Serve topped with Parmesan, if desired.

Breakfast Burritos

Vegetable cooking spray
2 egg whites
2 whole wheat tortillas
¼ cup fat-free cheese
¼ cup rinsed canned beans (pinto or black beans)
Salsa (to taste)

Directions

9. Spray vegetable cooking spray into a frying pan
10. Scramble the egg whites in the pan and cook to the desired degree of doneness
11. Place the cooked eggs on the tortillas
12. Sprinkle the cheese over the eggs
13. Place the beans over the cheese and eggs
14. Roll each tortilla into a wrap
15. Microwave for 30 seconds
16. Spoon salsa on top

Per serving:

Calories: 282
Total Fat: 3.6 grams
Saturated Fat: 1.5 grams
Protein: 23 grams
Total carbohydrates: 50 grams
Sodium: 833 milligrams

Sample Recipes for Diabetes and PAD

*Recipes were gathered from the American Diabetes Association

Dill and Feta Turkey Burgers

Serves: 4; Serving Size: 1

burger

- 1 pound extra-lean ground turkey breast
- 1 tablespoon Dijon mustard
- 1/2 cup fresh dill, finely chopped
- 1/4 tablespoon kosher salt
- Freshly ground pepper, to taste
- 1 tablespoon extra-virgin olive oil
- 2 ounces crumbled low fat feta cheese
- 4 (2 ounces) fresh bakery whole-wheat buns

Preparation

4. Preheat oven to 425°F.
5. Combine turkey, mustard, dill, salt, and pepper in a large bowl. Stir to combine. Divide the meat into four equal portions, and form into patties.
6. Heat oil in a large oven-proof skillet over medium heat. Add burgers, sauté for 2-3 minutes per side or until brown. Transfer to the oven, and cook for 15 minutes or until cooked through. Top with feta cheese, and cook for another 5 minutes or until cheese is melted. Serve on buns with a salad.

Nutrition Information

Calories: 335
Total Fat: 9 g
Saturated Fat: 2.4 g
Cholesterol: 60 mg
Sodium: 710 mg
Total Carbohydrate: 9 g
Protein: 36 g
Fiber: 4 g

Food Exchanges: 4 Lean Meat, 2 Starch

Chili Lime Shrimp

Prep Time: 5 min; **Serves:** 4

1 tsp olive oil
nonstick cooking spray
4 scallions (green and white parts), minced
1/4 cup lime juice
1 Tbsp minced garlic
1 Tbsp Splenda Brown Sugar Blend
1 tsp Asian-style chili-garlic sauce
9 ounces peeled and deveined raw medium shrimp

Preparation

5. Add olive oil and a generous amount of cooking spray to a nonstick skillet over medium-high heat.
6. Add scallions and sauté for 3-4 minutes.
7. In a small bowl, whisk together lime juice, garlic, brown sugar, and chili-garlic sauce. Pour over scallions and simmer until reduced by half, about 3–4 minutes.
8. Add shrimp and sauté until shrimp is pink and just cooked through, about 4 minutes.

Nutrition Information

Exchanges/Choices	Cholesterol 105 mg
1/2 Carbohydrate 2 Lean Meat	Sodium 570 mg
	Potassium 195 mg
Calories 100	Total Carbohydrate 6 g
Calories from Fat 20	Dietary Fiber 0 g
Total Fat 2.0 g	Sugars 2 g
Saturated Fat 0.4 g	Protein 14 g
Trans Fat 0.0 g	Phosphorus 150 mg

Chef's Tip: You should be able to find the chili-garlic sauce in the ethnic foods aisle of the grocery store.

Chicken Tenders and Spicy Tomato and Black Beans

Serves: 4

12 (about 1 1/4 lb) chicken tenders

1/2 tsp chili powder

1 10-oz can mild diced tomatoes and green chilies

1/2 15.5-oz can no-salt-added black beans, rinsed and drained

2 tsp extra virgin olive oil

1/2 cup fat-free sour cream

Serving size: 3 ounces cooked chicken, 1/2 cup bean mixture, and 2 tablespoons sour cream

Preparation

4. Sprinkle both sides of the chicken pieces evenly with chili powder.
5. Place a large nonstick skillet over medium-high heat until hot. Coat skillet with cooking spray, cook chicken 2 minutes or until browned on one side, turn, and top with the tomatoes and beans. Bring to a boil (over medium-high heat), and cook for 3 minutes or until chicken is no longer pink in the center.
6. Remove from heat and drizzle the oil evenly over all. Serve in shallow soup bowls, topped with sour cream.

Nutritional Information

Exchanges/Choices

1/2 Starch

1/2 Carbohydrate

4 Lean Meat

Calories: 265

Calories from Fat: 55

Total Fat: 6 g

Saturated Fat: 1.5 g

Trans Fat: 0 g

Cholesterol: 85 mg

Sodium: 405 mg

Total Carbohydrate: 16 g

Dietary Fiber: 3 g

Sugars: 4 g

Protein: 35 g

Some tips for this meal:

- The canned tomatoes and green chili's act as a "multi-tasker". There are multiple flavors and seasoning agents in one container.
- Economical dish because there are few ingredients and saves time in the kitchen and in clean up...and shopping.

- It's a great "on hand" dish. Keep chicken in freezer until needed.
- Great served over brown rice or whole grain pasta (1/2 cup per serving)

Healthy Food Substitutions

If your recipe calls for this ingredient:	Try substituting this ingredient:
Bacon	Canadian bacon, turkey bacon, smoked turkey or lean prosciutto (Italian ham)
Bread, white	Whole-grain bread
Bread crumbs, dry	Rolled oats or crushed bran cereal
Butter, margarine, shortening or oil in baked goods	Applesauce or prune puree for half of the called-for butter, shortening or oil; butter spreads or shortenings specially formulated for baking that don't have trans fats Note: To avoid dense, soggy or flat baked goods, don't substitute oil for butter or shortening. Also don't substitute diet, whipped or tub-style margarine for regular margarine.
Butter, margarine, shortening or oil to prevent sticking	Cooking spray or nonstick pans
Cream	Fat-free half-and-half, evaporated skim milk
Cream cheese, full fat	Fat-free or low-fat cream cheese, Neufchatel, or low-fat cottage cheese pureed until smooth
Eggs	Two egg whites or 1/4 cup egg substitute for each whole egg
Flour, all-purpose (plain)	Whole-wheat flour for half of the called-for all-purpose flour in baked goods Note: Whole-wheat pastry flour is less dense

	and works well in softer products like cakes and muffins.
Fruit canned in heavy syrup	Fruit canned in its own juices or in water, or fresh fruit
Ground beef	Extra-lean or lean ground beef, chicken or turkey breast (make sure no poultry skin has been added to the product)
Lettuce, iceberg	Arugula, chicory, collard greens, dandelion greens, kale, mustard greens, spinach or watercress
Mayonnaise	Reduced-calorie mayonnaise-type salad dressing or reduced-calorie, reduced-fat mayonnaise
Meat as the main ingredient	Three times as many vegetables as the meat on pizzas or in casseroles, soups and stews
Milk, evaporated	Evaporated skim milk
Milk, whole	Reduced-fat or fat-free milk
Oil-based marinades	Wine, balsamic vinegar, fruit juice or fat-free broth
Pasta, enriched (white)	Whole-wheat pasta
Rice, white	Brown rice, wild rice, bulgur or pearl barley
Salad dressing	Fat-free or reduced-calorie dressing or flavored vinegars
Seasoning salt, such as garlic salt, celery salt or onion salt	Herb-only seasonings, such as garlic powder, celery seed or onion flakes, or use finely chopped herbs or garlic, celery or onions
Soups, creamed	Fat-free milk-based soups, mashed potato flakes, or pureed carrots, potatoes or tofu for thickening agents
Soups, sauces, dressings, crackers, or canned meat, fish or vegetables	Low-sodium or reduced-sodium versions

Sour cream, full fat	Fat-free or low-fat sour cream, plain fat-free or low-fat yogurt
Soy sauce	Sweet-and-sour sauce, hot mustard sauce or low-sodium soy sauce
Sugar	In most baked goods you can reduce the amount of sugar by one-half; intensify sweetness by adding vanilla, nutmeg or cinnamon
Syrup	Pureed fruit, such as applesauce, or low-calorie, sugar-free syrup
Table salt	Herbs, spices, citrus juices (lemon, lime, orange), rice vinegar, salt-free seasoning mixes or herb blends
Yogurt, fruit-flavored	Plain yogurt with fresh fruit slices



Fitness Manual

A Guide to a Stronger You

Lauren Battles, Maia Sobolik, and Breann Lamborn, MPA

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Introduction

We are pleased to provide this manual to occupational therapy practitioners in order to assist elderly individuals who have experienced a lower limb amputation in implementing physical fitness into their daily routines. This will assist these individuals in establishing and restoring healthier habits, thus promoting a healthier lifestyle. This manual was created in order to help these individuals to not only live a healthier lifestyle, but also to assist them in managing their weight to ensure their prosthesis fits on a more consistent basis.

An extensive review of the literature was conducted in order to investigate the hardships these specific individuals face on a daily basis and it was discovered that many individuals are concerned with the proper fitting of their prosthetic device. It was also found that these individuals tend to live a more sedentary lifestyle when compared to other individuals with lower limb amputations. This provided the incentive to create this fitness manual in order to assist the elderly population who has sustained lower limb amputations in increasing their volition to properly manage their weight and to promote overall satisfaction and quality of life.

This fitness manual should be used with the companion nutrition manual in order to provide this population with a guide to promote overall health and weight management. These manuals should be used together in order to provide the elderly population with lower limb amputations the tools and resources that can help them achieve success in their daily habits and routines.

Manual Concepts

This document includes the following sections:

Introduction:

What is the purpose of this manual? Why is this important?

Physical Fitness:

What is it? Why is it important? What are the benefits?

Heart Rate and Oxygen Level:

What is it? Why is it important? What is normal? What does it mean?

Exercise Recommendations:

What are they? Why is exercise important? What are the different exercises?

Special Considerations:

What are the specific recommendations related to the two main causes of lower limb amputations for the elderly population?

Important Muscle Groups:

What are they? Why is it important to target different muscle groups? How do you target muscle groups? What are the benefits?

Sample Exercises:

What are some examples of exercises? How many repetitions should be performed? How many sets should be performed?

Additional Resources:

Where can more information be found in regards to these topics?

References:

Where did this information come from?

Client Handouts:

What do the clients need to take home with them to be successful?

Physical Fitness

Physical exercise can be defined as any physical activity that enhances or maintains physical fitness, while increasing or maintaining health and wellness. Exercise is completed for various reasons that are meaningful and specific to the individual. Physical exercise may include activities such as:

- Biking
- Hiking
- Running
- Walking
- Sports
- Dance
- Martial Arts
- Stationary Bike
- Fencing
- Treadmill
- Swimming
- Aerobics
- Badminton
- Cross Country Skiing
- Kayaking
- Snowshoeing
- Sexual Activity

It is important to educate individuals on the effects physical exercise can have on the mind, body, and spirit. There are various health related benefits associated with participating in one or more of these activities including: controlling weight, combating health conditions and diseases, improving mood, boosting energy needed for daily routines, promoting the habit of better sleep, increasing sexual drive, and providing individuals with enjoyment (Mayo Clinic, 2013). All of these benefits can lead to a more productive and satisfying life for the aging population.

Obesity is a growing global concern within society today and partaking in physical exercise may help decrease some of the effects of childhood and adult obesity. Therefore, it is important to encourage elderly individuals to examine both their volition and performance capacity related to physical fitness activities in order to develop successful patterns and routines in order to promote success with weight management.

Exercise is beneficial and important for everyone because it helps individuals feel better, have more energy, and live a longer life. Regular exercise can also decrease stress, thus diminishing worries while concentrating on working out. When exercising, the production of

endorphins increases thus reducing stress and anxiety. Exercise also works to increase muscle tone and mass, which will eventually increase resting metabolism. An increase in self-esteem and self-confidence can also be gained through exercise because once an individual develops the habit of working out, he or she will start to increase tone, shed fat, and feel better about body appearance. These factors will not only help to increase the volition for these individuals to continue to participate in physical fitness, but also potentially increase self-esteem related to their recent amputation.

Regular physical exercise can also decrease individuals' risk factors associated with: heart disease, high blood pressure, stroke, colon and breast cancers, diabetes, osteoporosis and fractures, and depression and dementia (University of Maryland Medical Center, 2011). Many of these conditions and diseases are directly related to the elderly population and by controlling or preventing these conditions; more time can be spent focusing on developing new routines and rituals regarding their recent amputations. Exercise benefits may also include: improvements of balance, mobility, and the ability to perform activities of daily living (University of Maryland Medical Center, 2011). Therefore, these benefits can positively impacting the way individuals use their prosthetic device

Heart Rate and Oxygen Level

The following information was obtained from Radomski and Trombly, (2008). The normal heart rate range at rest is between 60-100 beats per minute. Someone who is very fit (like a runner) may have a heart rate in the 40's-50's. While exercising during the first two weeks after recovering from an illness, the heart rate should not increase more than 20 bpm above resting for a patient with a heart attack and about 30 bpm for a patient after surgery.

Learning how to take a pulse is important because this allows the heart rate to be assessed while exercising. Monitoring the heart rate is important in order to ensure individuals are not overworked or placing too much strain on the body. Please refer to the following steps in order to learn how to take a pulse:

- Locate indentation on lateral side of wrist, about ½ proximal to wrist crease
- Palpate radial artery with index and middle finger
- Count number of pulsations for 10 sec
- Multiply that number by 6 to determine number of bpm
- Notice if pulse is regular or irregular
- Know “skipped” or early beats
- If any of these symptoms are noticed, take note of it and refer patient to see doctor for this to be taken care of

It is also important to know the locations on which to take a pulse. Please refer to the following information in order to know where to locate a pulse.

- Neck (carotid): Carotid pulse is found between the windpipe and neck muscle, just beneath lower jawbone 1. You can find it lateral to the Adam's apple but palpate gently, as overstimulation can cause HR to drop below 60 bpm, causing bradycardia
- Arm (brachial): found on the inside of your elbow within the crease on the pinky side

- Wrist (radial): found on the inside of the wrist on pinky side, under bony prominence

Oxygen is also an important factor to consider when exercising. It is considered one of the most important elements needed to sustain life. It is also responsible for destroying the harmful bacteria that resides within the body without affecting the beneficial bacteria. During aerobic exercises, more oxygen is required to fuel the body so it is essential to understand what is normal for oxygen levels. Normal oxygen stats are between 92-100%. If the oxygen level is below 90-92%, this usually indicates the individual needs to stop physical activities in order to increase the oxygen level.

Exercise Recommendations

Participating in regular physical fitness routines, which includes both aerobic and anaerobic components, can help to improve overall health, thus reducing the risk of various different chronic diseases. According to the Centers for Disease Control and Prevention (2011), there are specific physical activity guidelines depending on the age of the individual. Overall, it is important for all individuals to participate in physical activity.

Aerobic exercise provides individuals with cardiovascular conditioning. Examples of aerobic exercises include: swimming, cycling, walking, running, and jumping rope. All of these activities increase the heart rate and require more oxygen to be transmitted to the muscles in order for the muscles to move and burn fuel. When progressing aerobic exercises, first increase the speed, then increase the resistance, finally increase the duration. The benefits of aerobic exercises include: improves cardiovascular conditioning, decreases risk of heart disease, lowers blood pressure, increases “good” cholesterol, controls blood sugar, assists with weight maintenance/loss, improves lung functions, and decreases resting heart rate (Cleveland Clinic, 2013).

Anaerobic exercise does not require oxygen, but instead uses glycogen as the fuel to move the body. Anaerobic exercise also known as high intensity exercise occurs in short bursts because during these exercises the body builds up in lactic acid, which causes discomfort and fatigue. For example, a sprinter is considered anaerobic exercise while a marathoner is considered aerobic exercise. Examples include sprinting and weight lifting. Benefits of anaerobic exercise include: builds lean muscle mass, weight maintenance/loss, builds endurance, and builds fitness levels (Gibson, 2012).

According to the American Heart Association (2013), older individuals should participate in at least 30 minutes of aerobic exercise of moderate-intensity every day at least five days per week for a total of 150 minutes. Individuals also have the option to participate in at least 25 minutes of vigorous aerobic exercise at least three days a week for a total of 75 minutes. Individuals can participate in a combination of these types of exercises as well. It is also recommended that individuals participate in moderate to high intensity muscle-strengthening activity at least two or more days per week for additional health benefits.

For even greater health benefits, the Centers for Disease Control and Prevention (2011), recommends completing 300 minutes of moderate-intensity aerobic exercise each week as well as two or more days of muscle-strengthening exercises per week that target all of the major muscle groups. Individuals also have the option of completing 150 minutes of vigorous aerobic exercise each week with the addition of two or more days of muscle-strengthening exercises per week. A combination of moderate-intensity and vigorous exercises is also acceptable.

The Centers for Disease of Control and Prevention (2011), describe intensity of an exercise as how hard the body is working during an aerobic activity. In order to rate the intensity of an exercise, it is recommended to use a 10-point scale. On this scale, 0 represents sitting and 10 represents working as hard as the body will allow. Moderate-intensity aerobic exercise is then rated as a 5 or 6 on this scale because the exercises will increase the heart rate and need for oxygen. Vigorous activities are rated as a 7 or 8 because the heart rate will increase even more and it will be even harder to breathe.

Participating in muscle-strengthening activities is also important because these will prevent muscle loss as the body ages. In order to gain health benefits from these exercises, it is recommended to go to the point in which it is hard for the muscles to produce another repetition. A repetition is considered one complete movement of an activity such as doing one sit-up (Centers for Disease Control and Prevention, 2011).

It is important to remember that every individual is unique therefore; listening to the body can help prevent overload and injury. Talk to a physician before starting a fitness program in order to reveal any limitations or restrictions regarding certain diseases or diagnoses. If at any point during exercise unusual symptoms occur such as tightness in the chest, dizziness, confusion, or joint pain, please stop exercising immediately and contact a physician (Cleveland Clinic, 2013).

Special Considerations

The two main causes associated with lower limb amputations in the elderly individual include diabetes and peripheral arterial disease. The following are special considerations for these diseases in regards to physical activity.

Diabetes

Regular physical activity is especially important for those individuals with diabetes and those who are at risk for developing diabetes. Exercising is an important factor that should be incorporated into these individual's health routines in order to properly manage diabetes. Recommended exercises for this population include: aerobic exercises, strength training, flexibility and stretching exercises, balance exercises, and activities throughout the day (American Diabetes Association, 2013).

Aerobic and strengthening exercises are the two types of physical activity that are the most important for managing diabetes. It is recommended that these individuals aim for at least 30 minutes of moderate-to-vigorous intensity exercises at least five days a week. It is important to not skip more than two days without exercising (American Diabetes Association, 2013).

Strength training can assist in making the body more sensitive to insulin, thus lowering blood glucose. It can also help to reduce the risk for osteoporosis and bone fractures. The more muscle an individual has, the more calories he or she can burn, thus reducing obesity and other health complications. It is recommended individuals should do strength training two or three days a week in addition to aerobic exercise (American Diabetes Association, 2013).

Peripheral Arterial Disease (PAD)

Regular physical activity is considered the most effective treatment for peripheral artery disease. A regular walking program has many benefits associated for individuals with PAD. These benefits include: decreasing amount of rests needed, reducing leg pain, losing/maintaining weight, improving/maintaining muscle tone, reducing risk factors of a heart attack or stroke, and improving overall sense of well-being and quality of life (Cleveland Clinic, 2013).

When just starting a walking program, warm-up at a slower walking pace for five minutes. After warming-up, the individual should continue to walk as long as he or she can in order to maximize the results. It is recommended the individual walk for 30 minutes and slowly progress to 60 minutes. A cool-down should also be performed after completing the exercise (Cleveland Clinic, 2013).

The walking program should be completed three to five times per week. The walking intensity should be measure on a 10-point pain scale in regards to the pain experienced because of PAD symptoms. A pain of three or four should be maintained during the walking exercise. If the pain exceeds a three or four, the individual should rest until the pain subsides before continuing the walk (Cleveland Clinic, 2013).

It is important to remember the individual should stop walking if he or she experiences chest pain, shortness of breath, or increase in symptoms. A physician should be contacted if the symptoms continue to persist so further recommendations can be made (Cleveland Clinic, 2013).

Individuals can also be educated on how performing physical exercise cannot only reduce symptoms regarding diabetes and PAD, but also potentially prevent these diseases from occurring. Individuals should be encouraged to educate others on the importance of exercising and how these diseases could be prevented, therefore possibly preventing an amputation in the future.

Other Considerations

It is important to remember certain adjustments may need to be made depending on the individual and the level of amputation as well as the type of prosthetic device being used. Some individuals may not utilize a prosthetic device, thus further impacting the exercises that may be performed. Other co-morbidities associated with this specific age group may influence the individual's ability to participate in these exercises; therefore additional attention is required in regards to the performance capacity of these individuals.

For further information regarding specific exercise programs regarding the level of lower limb amputation, please refer to Sierra Orthopedic Laboratory, Inc.

Arthritis

As people age, their risk for developing arthritis increases. According to the Arthritis Foundation (2013), an exercise program for individuals with arthritis will assist them in keeping joints flexible and muscles strong, sleep better, increase energy, and improve the overall outlook on life. Exercising can also help to reduce pain, promote confidence while performing daily routines, and increase social interactions. It is even more important for these individuals to partake in exercise routines because inactivity may lead to increased risk of becoming obese, thus leading to more pain and difficulty participating in meaningful occupations.

Cognitive Impairment

Cognitive impairments are another condition that often affects the aging population. According to Baker et al. (2010), exercise can improve the cognitive functioning of those with mild cognitive impairments. Accommodations may need to be made in order to ensure individuals are performing the exercises correctly and safely, however decreased cognition should not stop people from participating in exercise routines.

Falls

Falls commonly occur within the aging population, which can often be connected to decreased strength and cognition. According to Sherrington et al. (2008), exercise can prevent falls in older individuals. Exercises have various health benefits including increased strength, balance, and coordination. All of these factors can help prevent falls, thus improving overall quality of life within the aging population.

Important Muscle Groups

It is important to exercise all muscle groups because each muscle helps to perform different actions. Exercising different muscles will help to provide an overall improvement to the entire body. The following chart identifies the major muscle groups, their location within the body, and the functional role they play as well as some sample exercises and stretches. The following information was gathered from Livestrong (2013), Fit To Do (2013), Sciences360 (2013), and EXRX, (2013).

Major Muscle Groups

Muscle Group	Location	Functional Role	Exercises
Abdominals	Stomach	Postural alignment, support spine, sitting up	Crunches, leg raises, twisting crunches
Gluteals	Buttocks	Climbing stairs, walking, standing up, move legs away from the center of the body	Squats, leg press
Latissimus Dorsi	Mid-back	Rotate arm, pull open a door	Pull ups, chin ups, lat pull downs
Pectorals Major	Chest	Move arms inward, push up from lying position, push open a door	Push-ups, pull-ups, bench press, chest press
Trapezius	Upper and mid-back	Moves head sideways	Upright rows, shoulder shrugs
Deltoids	Top of shoulder	Move arms forward, backwards, and outwards, overhead lifting	Push-ups, bench press, side and rear arm raises
Biceps Brachii	Front of upper arm	Bending the elbow, lifting, pulling	Bicep curls
Triceps Trachii	Back of upper arm	Straighten the arm, pushing	Push-ups, tricep extensions, dips
Quadriceps	Front of thigh	Bend the hip, straiten the knee, climbing stairs, walking, standing up	Squats, lunges, leg press
Hamstrings and Gastrocnemius	Back of thigh Back of lower leg	Bend the knee, walking Standing on tiptoes	Squats, lunges, leg extensions, leg curls Standing calf raises, seated calf raises

Fig. 6

Sample Exercises

Stretching

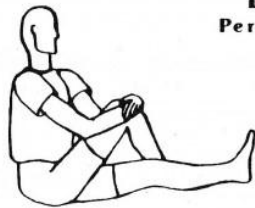
Stretching before and after exercising can decrease the risk injuries. Stretching can also assist in increasing flexibility and range of motion in the joints (Mayo Clinic, 2013).



Fig. 7
blog.overtheedgefit.com

LOWER BODY STRETCHES

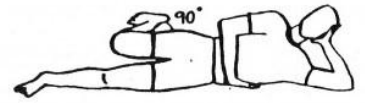
Perform each stretch 3-5 times and hold 8-15 seconds



Gluteals



Low Back and gluteals



Quadriceps



Hamstrings



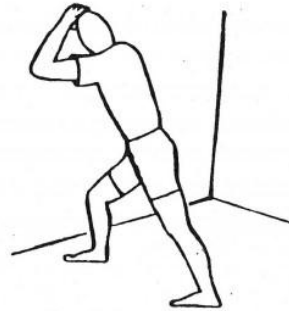
Hamstrings



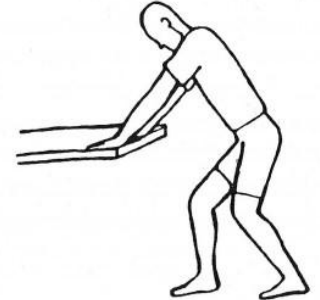
Hip Flexors



Adductors



Gastrocnemius



Soleus and Achilles Tendon

Fig. 8
blog.overtheedgefit.com

Range of Motion

Range of motion exercises can help keep the muscles and joints healthy because it helps to keep or build muscle mass. These exercises assist in increasing flexibility within the joints and help to increase blood flow through the joints as well (Allina Health, 2012).

Each joint within the body is responsible for different actions. It is important to keep these joints active in order to prevent stiffness as well as further complications.

Spinal Colum:

Flexion
Extension
Lateral flexion
Rotation

Shoulder Girdle:

Elevation
Depression
Adduction
Abduction

Shoulder Joint:

Flexion
Extension
Adduction
Abduction
Medial rotation

Elbow Joint:

Flexion
Extension
Pronation
Supination

Wrist Joint:

Flexion
Extension
Adduction
Abduction
Circumduction

Hip Joint:

Flexion
Extension
Adduction
Abduction
Medial rotation
Lateral rotation

Knee Joint:

Flexion
Extension

Ankle Joint:

Plantar flexion
Dorsi flexion
Inversion
Eversion

Strengthening

It is important to exercise the different muscle groups. The following exercises are provided to allow individuals to create their own workout routine. A variety of exercises should be utilized in order to ensure all muscle groups remain strong for daily activities. When first starting to exercise, a smaller number of repetitions should be performed to prevent injuries. The number of repetitions and sets should be increased as the individual becomes stronger.

*Perform 5-10 repetitions for three sets

*Perform 10-15 repetitions for three sets

*Perform 15-20 repetitions for three sets

Chest Exercises

- Flat Barbell or Dumbbell Bench Press
- Incline Barbell or Dumbbell Bench Press
- Decline Barbell or Dumbbell Bench Press
- Flat Chest Press Machine
- Incline Chest Press Machine
- Decline Chest Press Machine
- Dips (on parallel bars with slight forward lean)
- Push-Ups
- Flat Dumbbell Fly
- Incline Dumbbell Fly
- Decline Dumbbell Fly
- Pectoral Deck Machine
- Cable Crossovers/Cable Fly

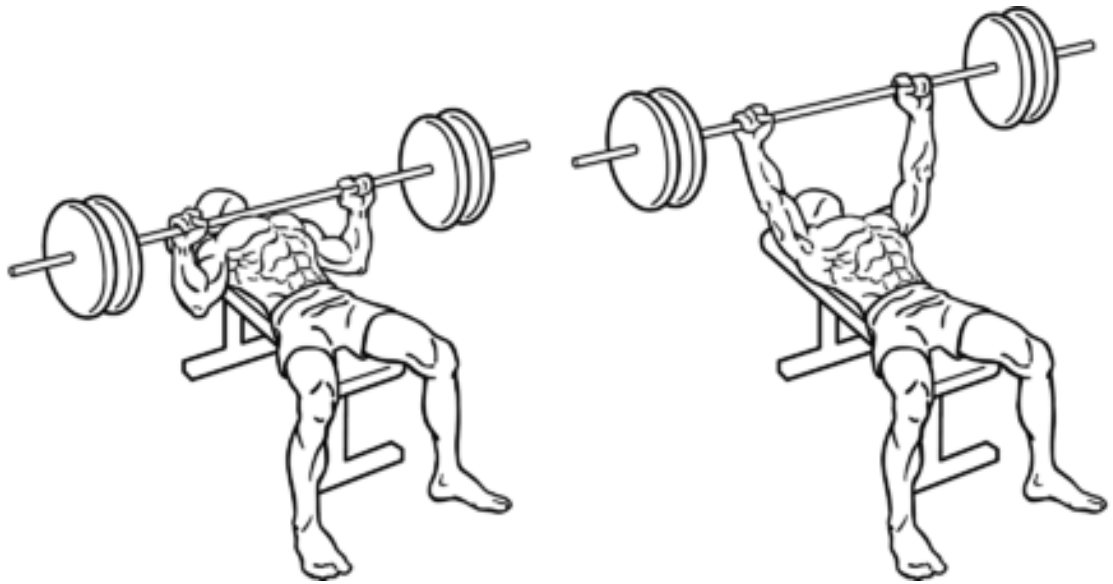


Fig. 9

Bench Press

http://en.m.wikipedia.org/wiki/Bench_press

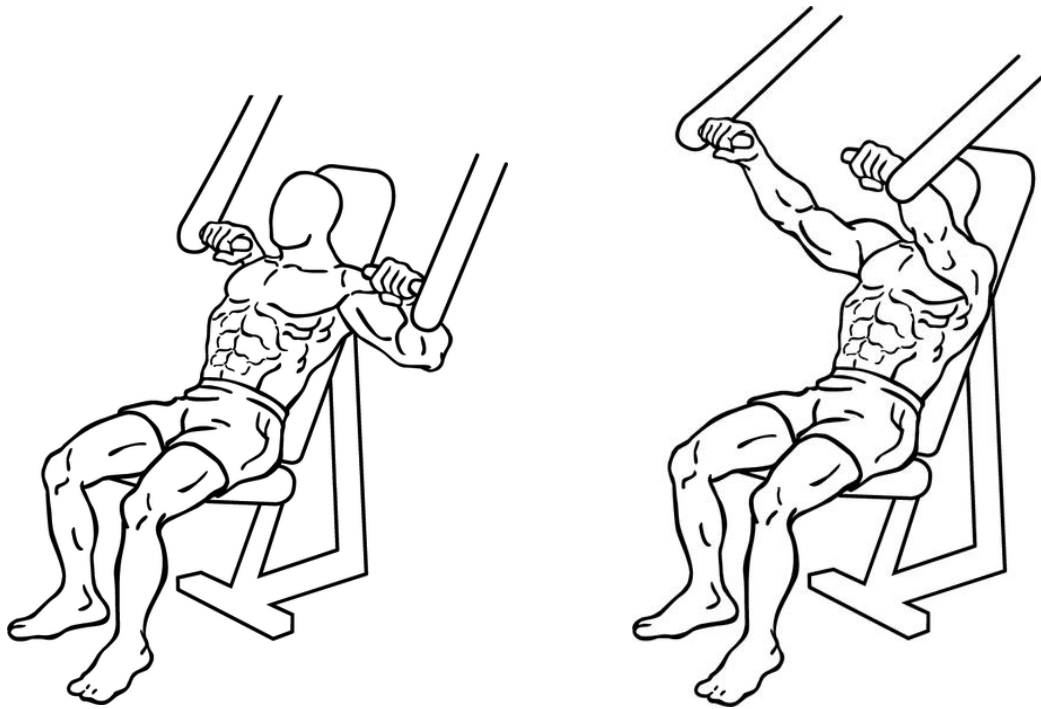


Fig. 10

Chest Press

<http://commons.wikimedia.org/wiki/File:Incline-chest-press-2.png>

<http://commons.wikimedia.org/wiki/File:Incline-chest-press-1.png>



Fig. 11
Push-ups
en.m.wikipedia.org/wiki/Push-up

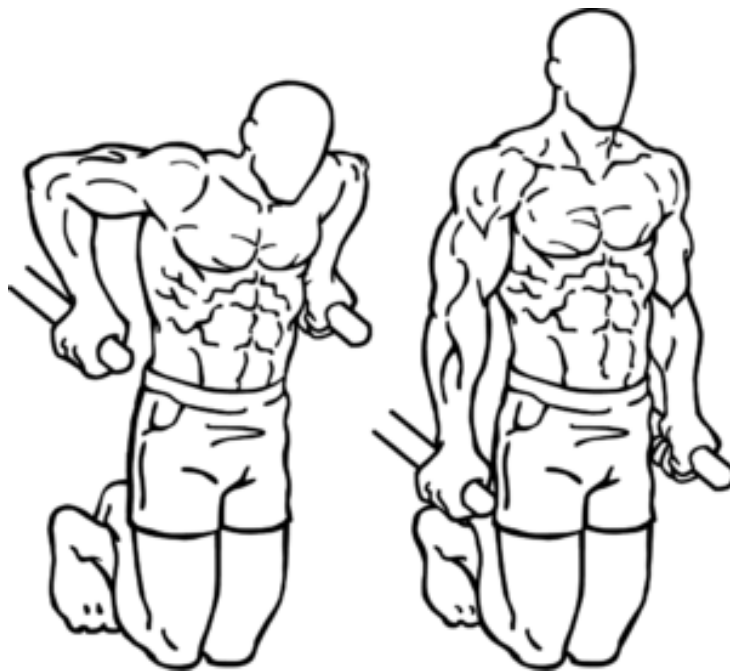


Fig. 12
Dips
[http://en.m.wikipedia.org/wiki/Dip_\(exercise\)](http://en.m.wikipedia.org/wiki/Dip_(exercise))

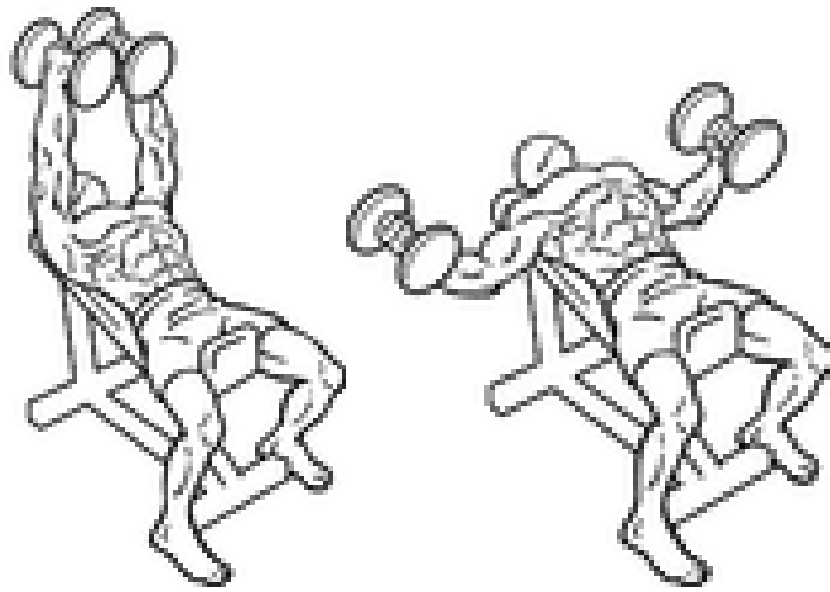


Fig. 13

Fly

[http://en.m.wikipedia.org/wiki/Fly_\(exercise\)](http://en.m.wikipedia.org/wiki/Fly_(exercise))

Back Exercises

- Pull-Ups
- Chin-Ups
- Lat Pull-Downs
- Bent Over Barbell or Dumbbell Rows
- T-Bar Rows
- Seated Cable Rows
- Chest Supported Barbell or Dumbbell Rows
- Chest Supported Machine Rows
- Inverted Rows
- Barbell, Dumbbell or Machine Shrugs

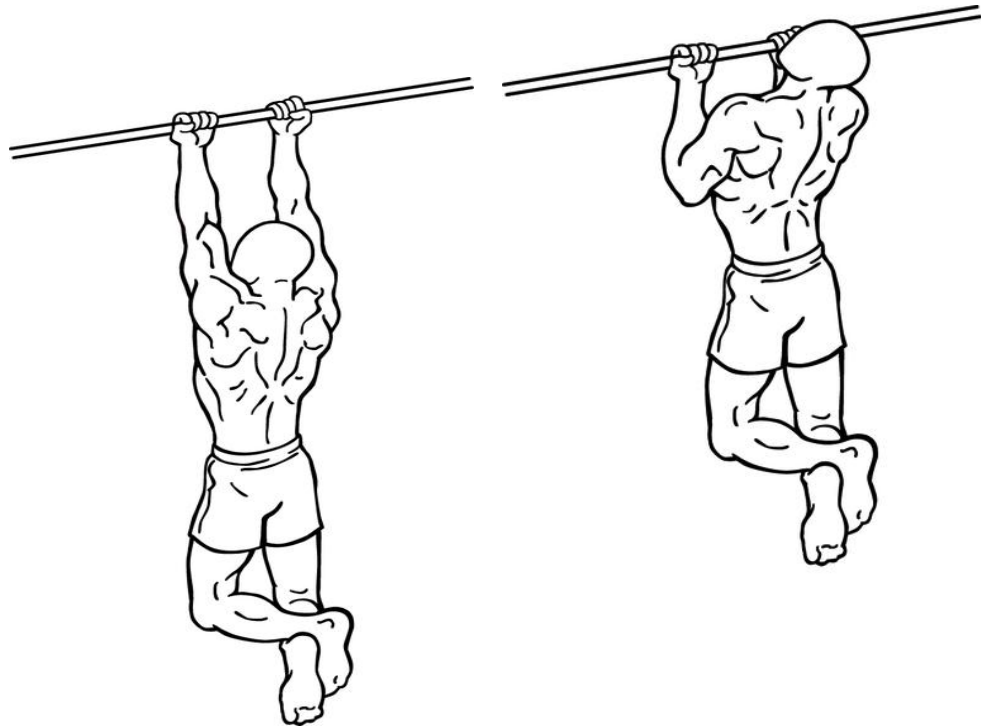


Fig. 14
Chin-ups

<http://commons.wikimedia.org/wiki/File:Chin-ups-2.png>
<http://commons.wikimedia.org/wiki/File:Chin-ups-1.png>

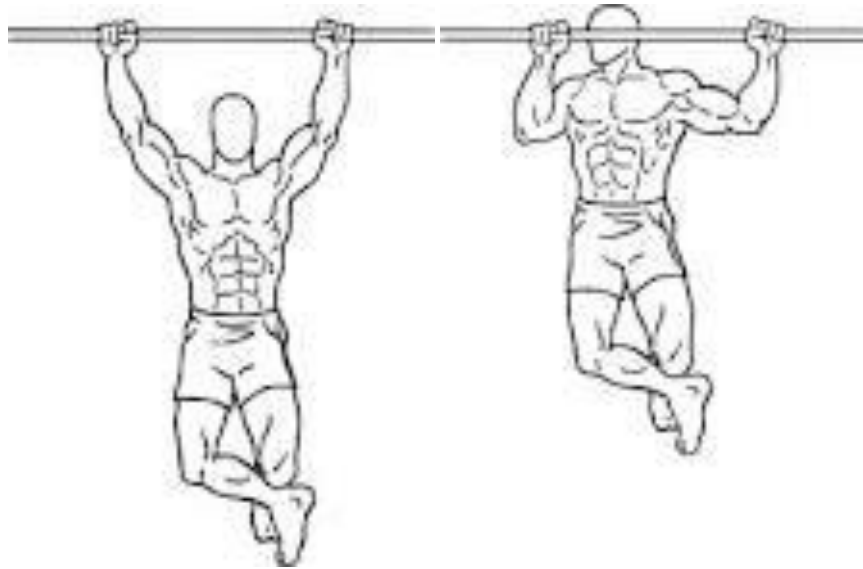


Fig. 15

Pull-ups

[en.m.wikipedia.org/wiki/Pull-up_\(exercise\)](http://en.m.wikipedia.org/wiki/Pull-up_(exercise))

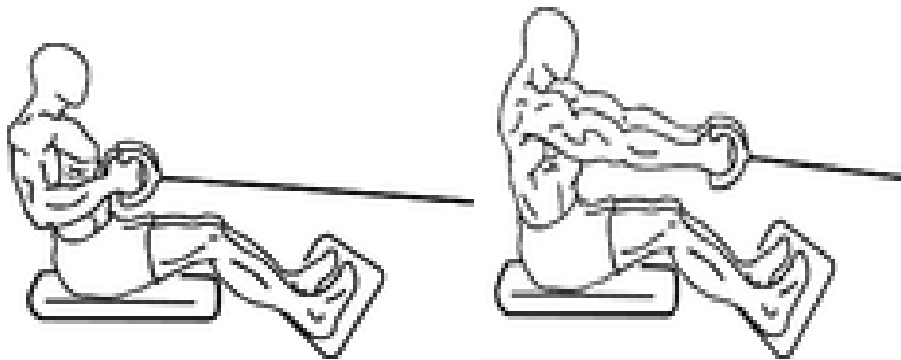


Fig. 16

Row

[http://en.m.wikipedia.org/wiki/Row_\(weight-lifting\)](http://en.m.wikipedia.org/wiki/Row_(weight-lifting))

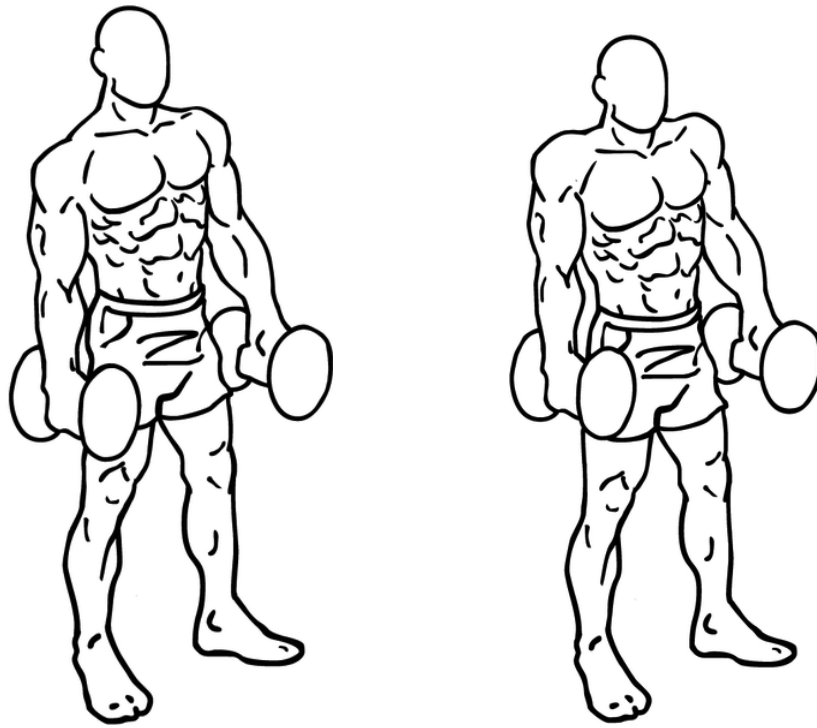


Fig. 17
Shrugs

<http://commons.wikimedia.org/wiki/File:Dumbbell-shrugs-2.png>
<http://commons.wikimedia.org/wiki/File:Dumbbell-shrugs-1.png>

Shoulder Exercises

- Seated Overhead Barbell or Dumbbell Press
- Standing Overhead Barbell or Dumbbell Press
- Overhead Machine Press
- Arnold Press
- Barbell, Dumbbell or Machine Upright Rows
- Dumbbell, Cable or Machine Lateral Raises
- Dumbbell, Cable or Machine Front Raises
- Barbell, Dumbbell, or Machine Rear Deltoid Rows, Raises, or Fly

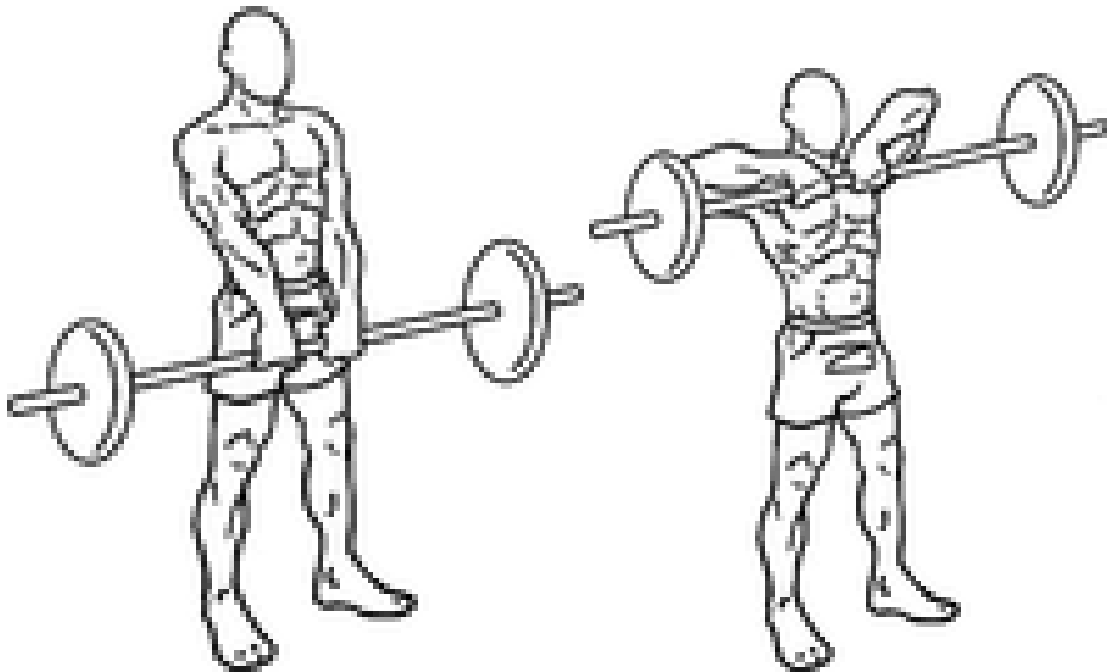


Fig. 18

Upright Rows

http://en.m.wikipedia.org/wiki/Upright_rows

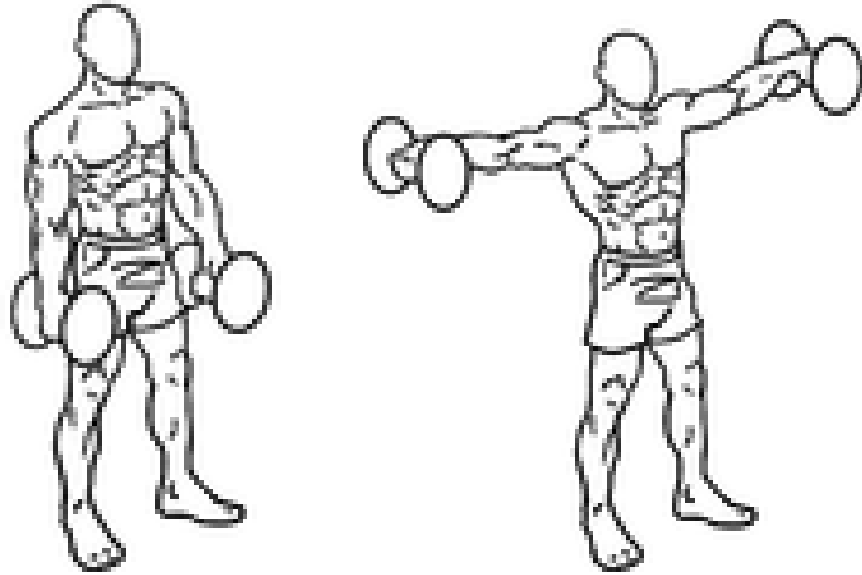


Fig. 19
Lateral Raises
http://en.m.wikipedia.org/wiki/Lateral_raise

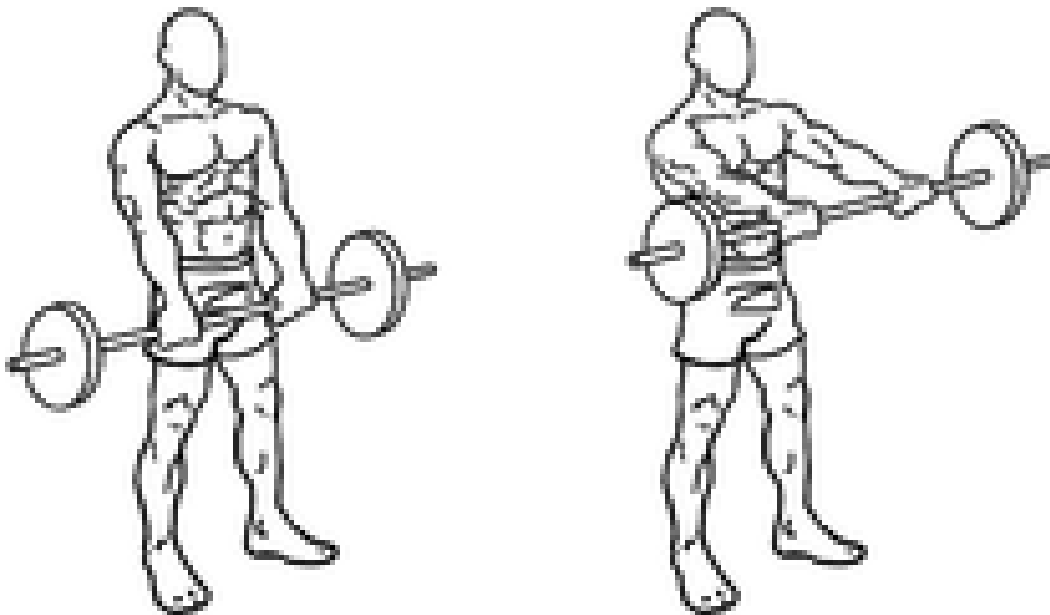


Fig. 20
Front Raises
http://en.m.wikipedia.org/wiki/Front_raise

Quadriceps Exercises

- Barbell or Dumbbell Squats
- Barbell or Dumbbell Front Squats
- Barbell or Dumbbell Split Squats
- Barbell or Dumbbell Lunges
- Barbell or Dumbbell Step-Ups
- Leg Press
- Machine Squat/Hack Squat
- Leg Extensions

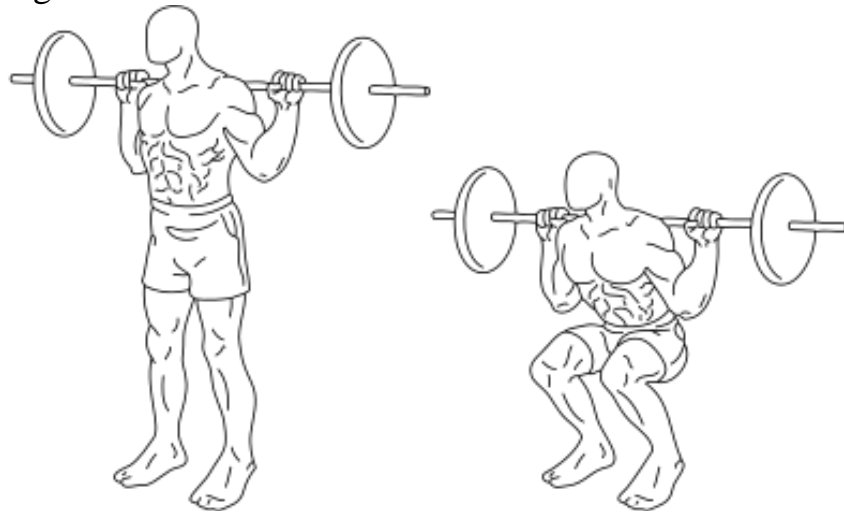


Fig. 21

Squats

[http://en.m.wikipedia.org/wiki/Squat_\(exercise\)](http://en.m.wikipedia.org/wiki/Squat_(exercise))

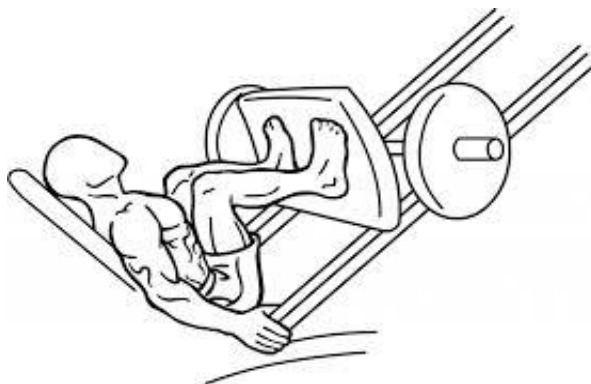


Fig. 22

Leg Press

commons.wikimedia.org

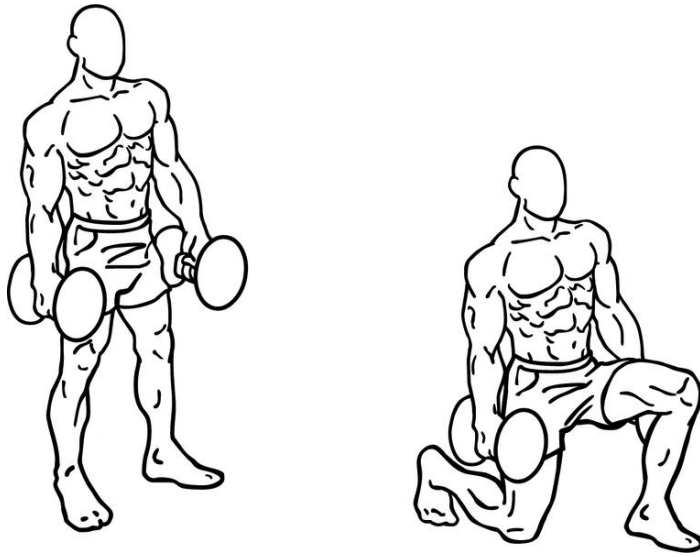


Fig. 23
Lunges

<http://commons.wikimedia.org/wiki/File:Lunges-2-1.png>
<http://commons.wikimedia.org/wiki/File:Lunges-2-2.png>

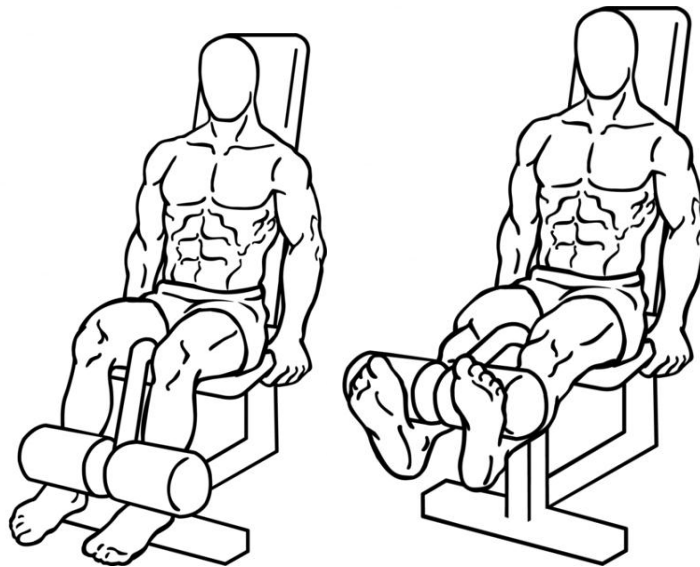


Fig. 24
Leg Extensions

<http://commons.wikimedia.org/wiki/File:Leg-extensions-1-672x1024.png>
<http://commons.wikimedia.org/wiki/File:Leg-extensions-2-672x1024.png>

Hamstring Exercises

- Barbell or Dumbbell Romanian Deadlifts
- Barbell or Dumbbell Straight Leg Deadlifts
- Barbell or Dumbbell Sumo Deadlifts
- Hyperextensions
- Good-Mornings
- Leg Curls

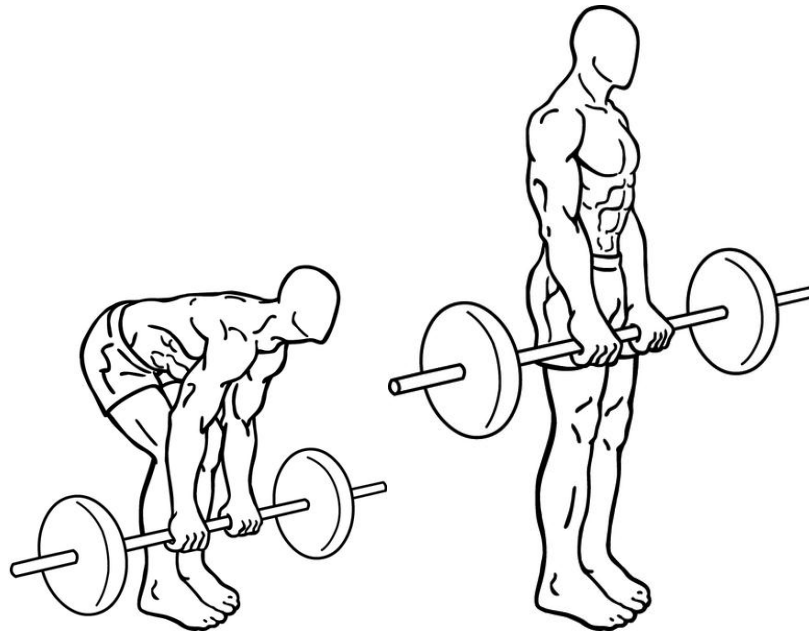


Fig. 25
Deadlift

<http://commons.wikimedia.org/wiki/File:Romanian-deadlift-2.png>
<http://commons.wikimedia.org/wiki/File:Romanian-deadlift-1.png>

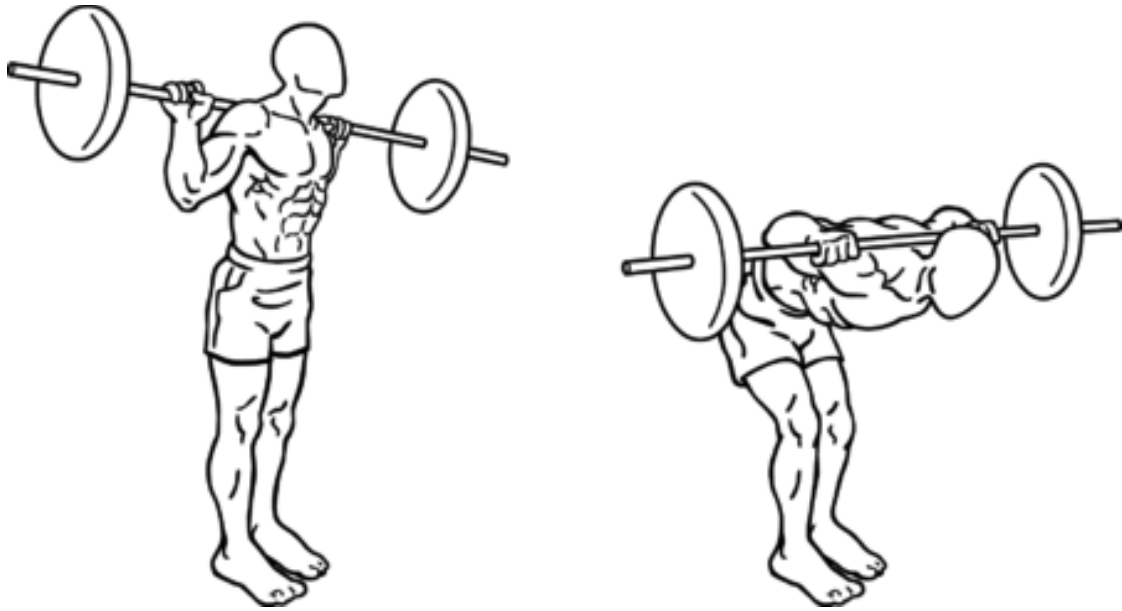


Fig. 26

Good-mornings

<http://en.m.wikipedia.org/wiki/Good-morning>

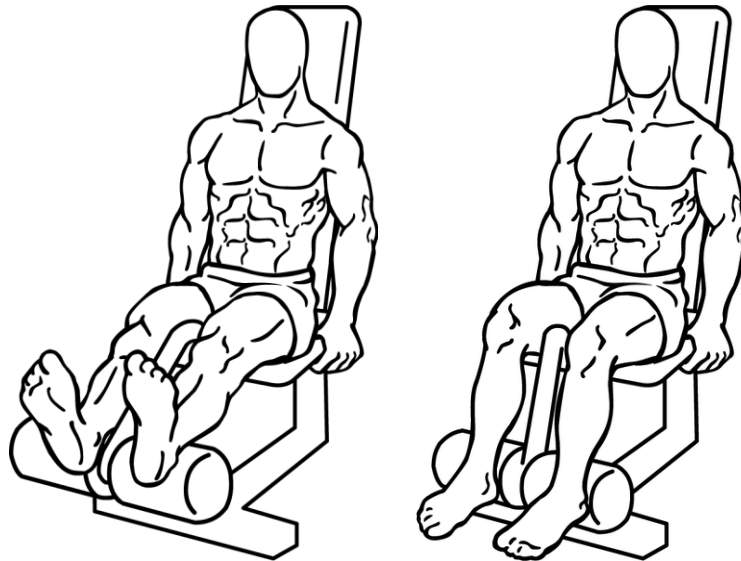


Fig. 27

Leg Curls

<http://commons.wikimedia.org/wiki/File:Seated-leg-curl-2.png>
<http://commons.wikimedia.org/wiki/File:Seated-leg-curl-1.png>

Biceps Exercises

- Standing Barbell or Dumbbell Curls
- Barbell or Dumbbell Preacher Curls
- Seated Dumbbell Curls
- Incline Dumbbell Curls
- Hammer Curls
- Concentration Curls
- Cable Curls
- Biceps Curl Machine

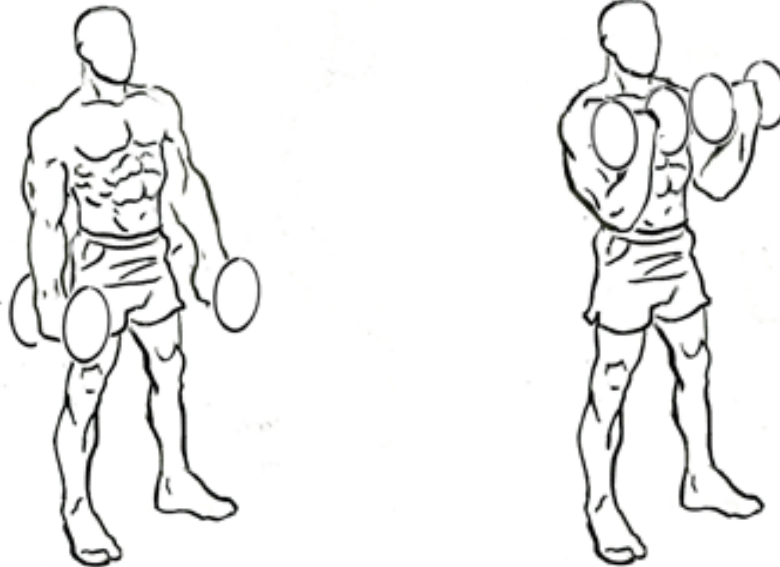


Fig. 28
Dumbbell Curls

<http://commons.wikimedia.org/wiki/File:Biceps-curl-1.gif>
<http://commons.wikimedia.org/wiki/File:Biceps-curl-2.gif>

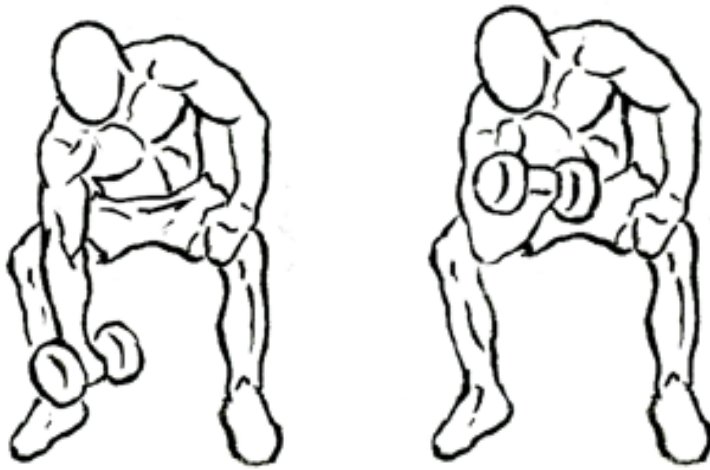


Fig. 29
Concentration Curls

<http://commons.wikimedia.org/wiki/File:Concentration-curls-1.gif>
<http://commons.wikimedia.org/wiki/File:Concentration-curls-2.gif>

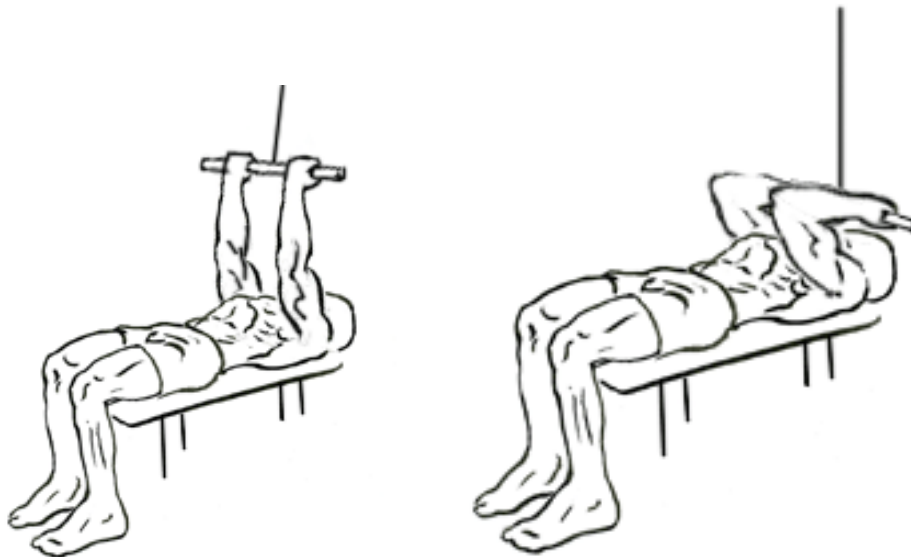


Fig. 30
Cable Curls

<http://commons.wikimedia.org/wiki/File:High-cable-curls-1.gif>
<http://commons.wikimedia.org/wiki/File:High-cable-curls-2.gif>

Triceps Exercises

- Dips (on parallel bars, elbows close to body, without forward lean)
- Flat Close Grip Bench Press
- Decline Close Grip Bench Press
- Close Grip Push-Ups
- Laying Barbell or Dumbbell Triceps Extensions
- Skull Crushers
- Overhead Barbell or Dumbbell Triceps Extensions
- Cable Press-downs
- Bench Dips



Fig. 31
Triceps Extension

<http://commons.wikimedia.org/wiki/File:Decline-triceps-extension-1.gif>
<http://commons.wikimedia.org/wiki/File:Decline-triceps-extension-2.gif>

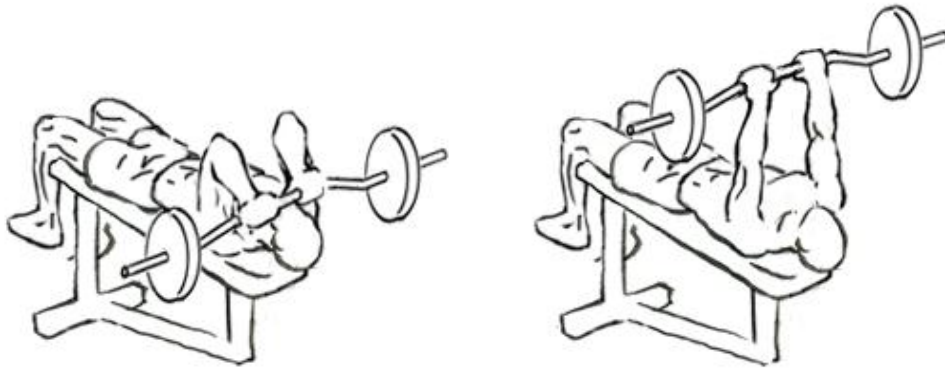


Fig. 32
Skull Crushers

<http://commons.wikimedia.org/wiki/File:Decline-close-grip-bench-to-skull-crusher-1.gif>
<http://commons.wikimedia.org/wiki/File:Decline-close-grip-bench-to-skull-crusher-2.gif>

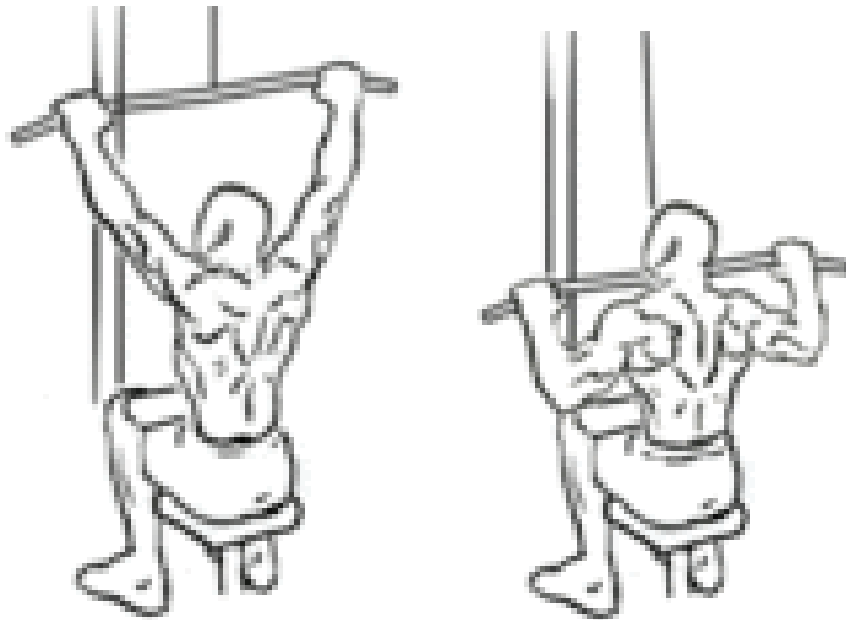


Fig. 33
Cable Pull-downs

http://en.m.wikipedia.org/wiki/Pulldown_exercise

Additional Resources

Livestrong Foundation: www.livestrong.com

Mayo Clinic: www.mayoclinic.com

Cleveland Clinic: www.my.clevelandclinic.org

American Diabetes Association: www.diabetes.org

Sierra Orthopedic Laboratory, Inc.: www.sierraortho.com



Client Handouts

Physical Fitness

- Exercise is important to your maintain health and wellness
- Benefits include:
 - Promotes a healthy mind, body, and spirit
 - Controls your weight
 - Helps to prevent diseases and injuries
 - Improves your mood
 - Boosts your energy
 - Promotes sleep
 - Increases your sexual drive
 - Decreases your stress and anxiety

Exercise Recommendations

- You should do both aerobic and anaerobic exercises
 - Aerobic exercises: swimming, cycling, walking, running, and jumping rope
 - Benefits: lowers your blood pressure, decreases your risk of heart disease, increases your heart functioning, controls your blood sugar, improves your lung function, helps with weight loss and maintenance
 - Anaerobic exercises: sprinting and weight lifting
 - Benefits: builds your muscle mass, builds your endurance, helps with weight loss and maintenance
- You should participate in at least 30 minutes of aerobic exercise at least 5 days a week

Special Considerations

- Diabetes
 - Exercise helps to manage your side-effects of diabetes
 - Important exercises: aerobic exercise, strength training, stretching exercises, and balance exercises
- Peripheral artery disease (PAD)
 - Exercise is very important for your treatment of this disease
 - Walking program is key
 - Benefits: reduces your amount of rest breaks needed, reduces your leg pain, improves your muscle tone, reduces your risk factors for diseases

- When your first start: start slow, include a warm-up and cool-down, and progress from 30 minutes to 60 minutes
 - You should walk 3-5 times a week
 - You should take note of your pain
 - If it is too painful, you should stop walking
- Arthritis
 - Exercise benefits:
 - Helps to keep your joints flexible and muscles strong
 - Promotes sleep
 - Increases your energy
 - Reduces your pain
 - Inactivity can lead to obesity and your increase side-effects
- Cognitive Impairments
 - Exercise can help to improve your cognitive functioning
 - Remember to consider your safety when exercising
- Falls
 - Falls can be connected to decreased strength and cognition
 - Increased strength, coordination, and balance can reduce your chance of falling

Important Muscle Groups

- Stomach
 - Helps you to sit up
- Buttocks
 - Helps you to climb stairs and stand up
- Mid-back
 - Helps you to pull open a door
- Chest
 - Helps you to push open a door
 - Helps you to push up off the floor
- Upper and mid-back
 - Moves your head to the side
- Top of shoulder
 - Helps to move your arms
 - Helps you to lift things over your head
- Front of upper arm
 - Helps you to bend your elbow
 - Helps you to lift and pull objects

- Back of upper arm
 - Helps you to straighten your elbow
 - Help you to push objects
- Front of thigh
 - Helps to bend your hip and straighten your knee
 - Helps you to climb stairs, walking, and stand up
- Back of thigh and back of lower leg
 - Helps you to bend the knee and walk
 - Helps you to stand on your tiptoes

Sample Exercises

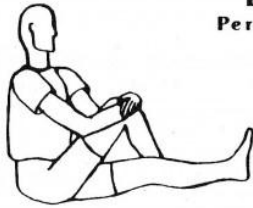
Stretches

You should stretch before and after exercises to decrease your risk of injuries. Stretching can also increase flexibility and range of motion in your joints.



LOWER BODY STRETCHES

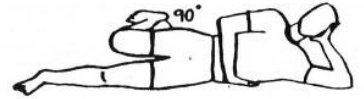
Perform each stretch 3-5 times and hold 8-15 seconds



Gluteals



Low Back and gluteals



Quadriceps



Hamstrings



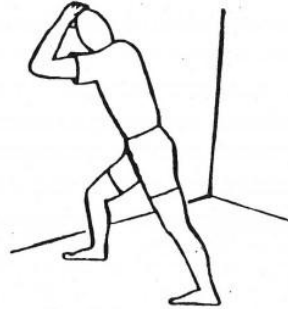
Hamstrings



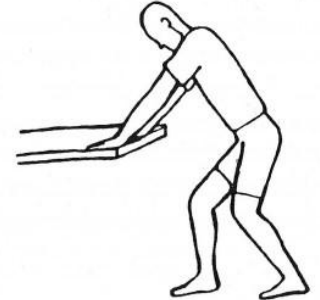
Hip Flexors



Adductors



Gastrocnemius



Soleus and Achilles Tendon

blog.overtheedgefit.com

Range of Motion

Range of motion exercises can help keep your muscles and joints healthy because it helps to keep or build your muscle mass. These exercises also help in increasing your flexibility within your joints.

Each joint within your body is responsible for different actions. It is important to keep all of your joints active to help prevent stiffness.

Spine:

- Bend your back forward
- Bend your back backwards
- Bend to your side
- Twist your back

Elbow Joint:

- Bend your elbow
- Straighten your elbows
- Turn your palms up
- Turn your palms down

Hip Joint:

- Bring your knees to your chest
- Raise your leg behind you
- Cross your leg over your other leg
- Move your leg out to the side
- Rotate your foot in
- Rotate your foot out

Knee Joint:

- Bend your knee
- Straighten your knee

Wrist Joint:

- Bend your wrist down
- Bend your wrist up
- Bend your wrist to the sides
- Rotate your wrist in a circle

Ankle Joint:

- Point your toes up
- Point your toes down
- Turn your toes in
- Turn your toes out

Shoulder Joint:

- Raise your arms in front of you
- Raise your arms behind you
- Raise your shoulders
- Lower your shoulders
- Cross your arm to opposite hip
- Raise your arms out to the side
- Push your shoulders forward

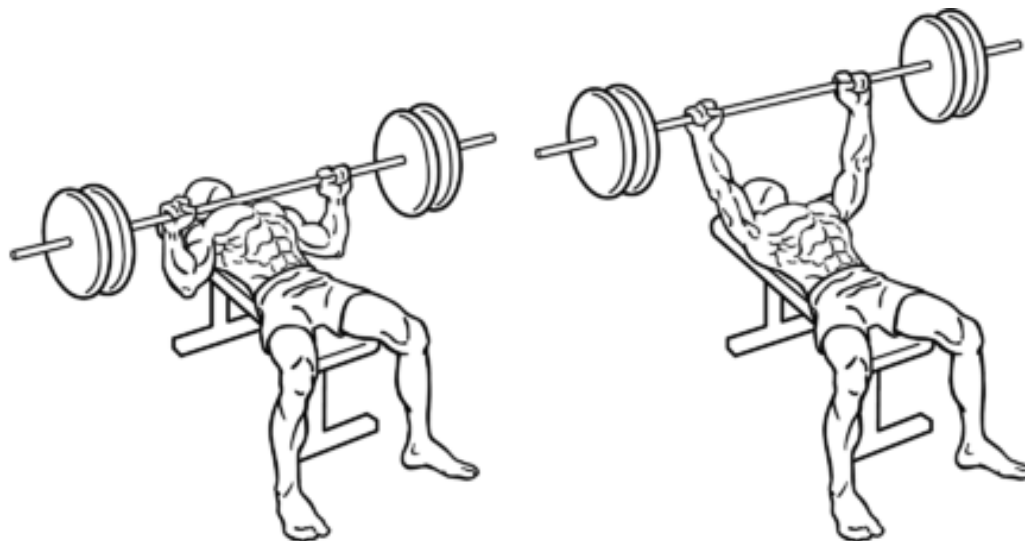
Strengthening

It is important for you to exercise the different important muscle groups. The following exercises can help you to exercise the different muscle groups. When you first start working out, start with a smaller number of repetitions and work your way up to more repetitions. This helps you to prevent injuries.

- *Perform 5-10 repetitions for three sets
- *Perform 10-15 repetitions for three sets
- *Perform 15-20 repetitions for three sets

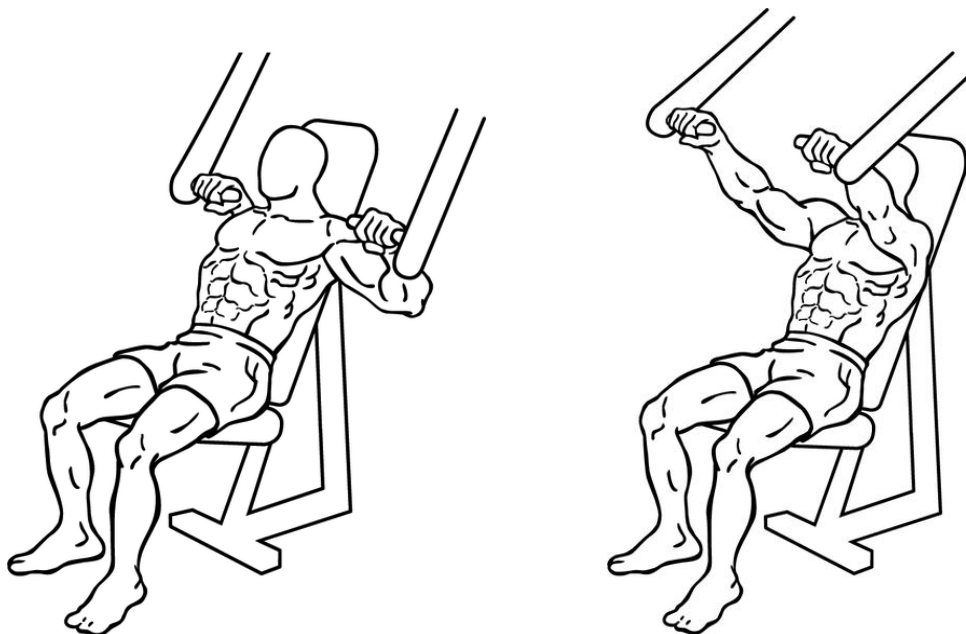
Chest Exercises

- Flat Barbell or Dumbbell Bench Press
- Incline Barbell or Dumbbell Bench Press
- Decline Barbell or Dumbbell Bench Press
- Flat Chest Press Machine
- Incline Chest Press Machine
- Decline Chest Press Machine
- Dips (on parallel bars with slight forward lean)
- Push-Ups
- Flat Dumbbell Fly
- Incline Dumbbell Fly
- Decline Dumbbell Fly
- Pectoral Deck Machine
- Cable Crossovers/Cable Fly



Bench Press

http://en.m.wikipedia.org/wiki/Bench_press



Chest Press

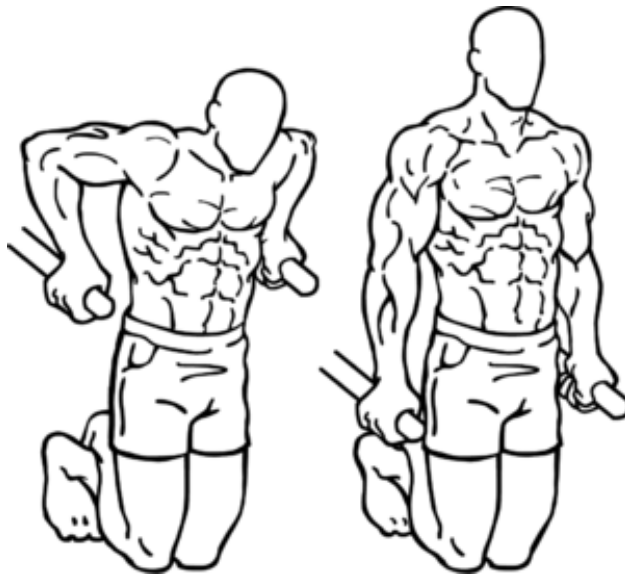
<http://commons.wikimedia.org/wiki/File:Inline-chest-press-2.png>

<http://commons.wikimedia.org/wiki/File:Inline-chest-press-1.png>



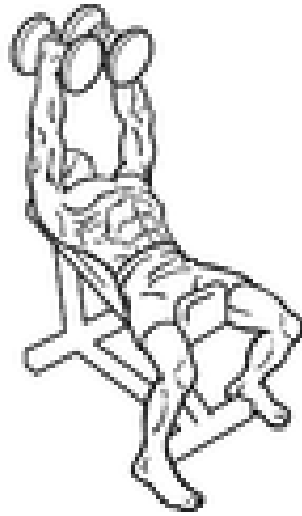
Push-ups

en.m.wikipedia.org/wiki/Push-up



Dips

[http://en.m.wikipedia.org/wiki/Dip_\(exercise\)](http://en.m.wikipedia.org/wiki/Dip_(exercise))

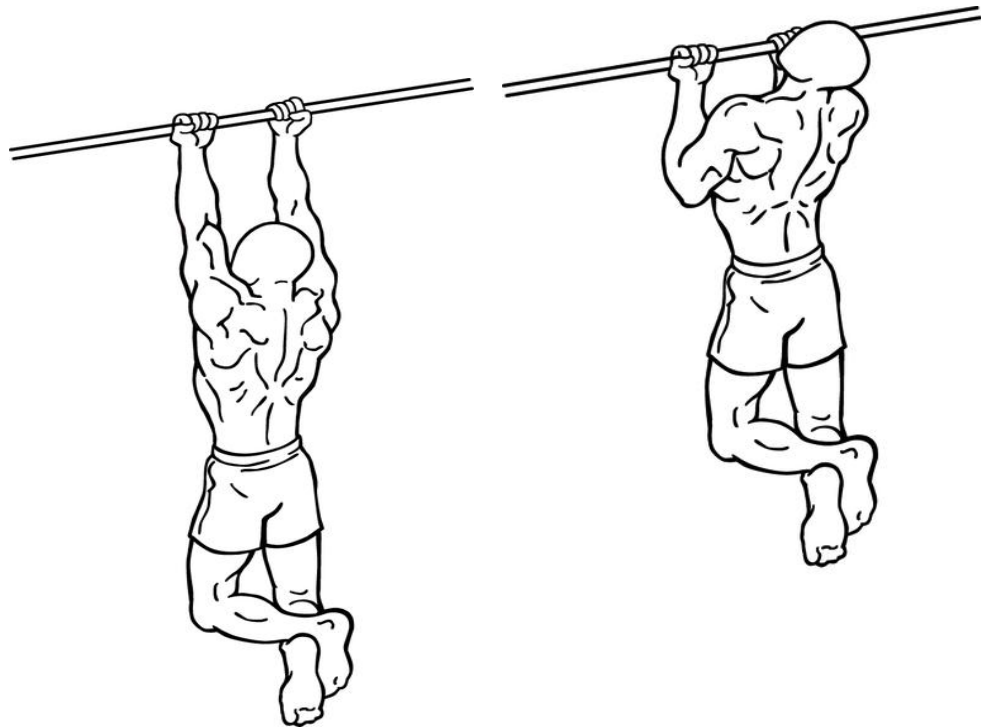


Fly

[http://en.m.wikipedia.org/wiki/Fly_\(exercise\)](http://en.m.wikipedia.org/wiki/Fly_(exercise))

Back Exercises

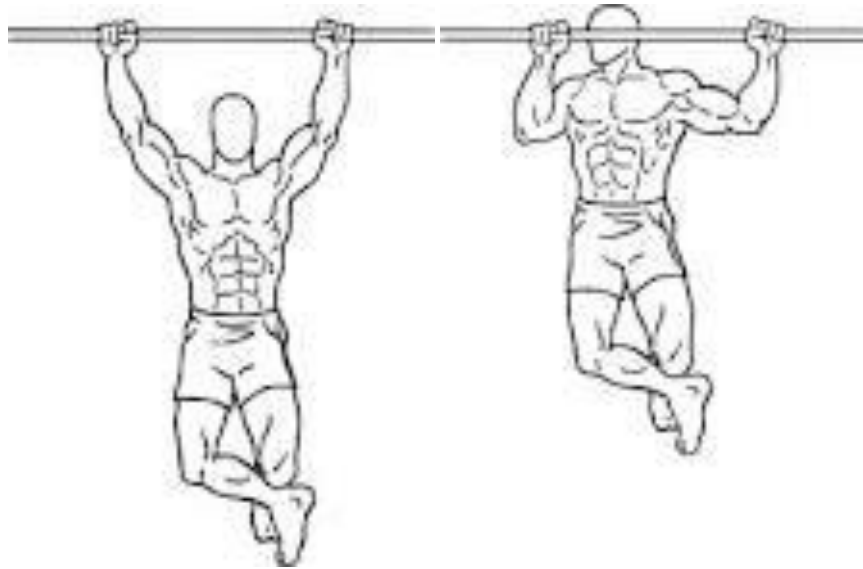
- Pull-Ups
- Chin-Ups
- Lat Pull-Downs
- Bent Over Barbell or Dumbbell Rows
- T-Bar Rows
- Seated Cable Rows
- Chest Supported Barbell or Dumbbell Rows
- Chest Supported Machine Rows
- Inverted Rows
- Barbell, Dumbbell or Machine Shrugs



Chin-ups

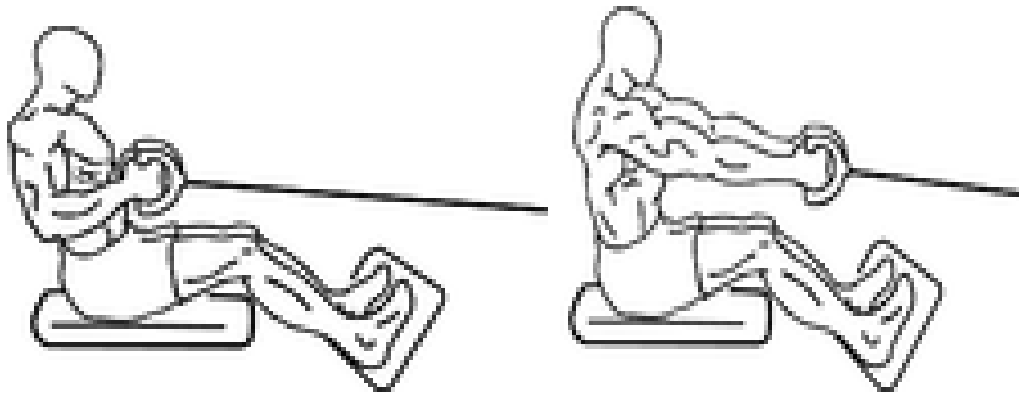
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<http://commons.wikimedia.org/wiki/File:Chin-ups-1.png>



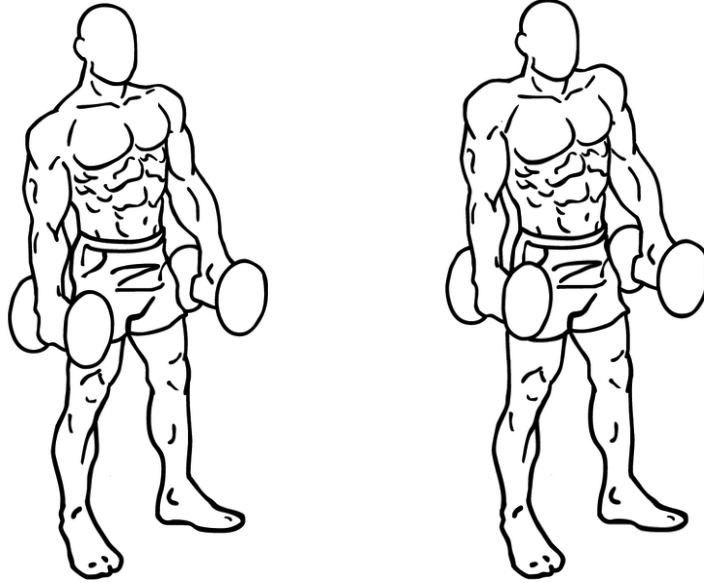
Pull-ups

[en.m.wikipedia.org/wiki/Pull-up_\(exercise\)](http://en.m.wikipedia.org/wiki/Pull-up_(exercise))



Row

[http://en.m.wikipedia.org/wiki/Row_\(weight-lifting\)](http://en.m.wikipedia.org/wiki/Row_(weight-lifting))

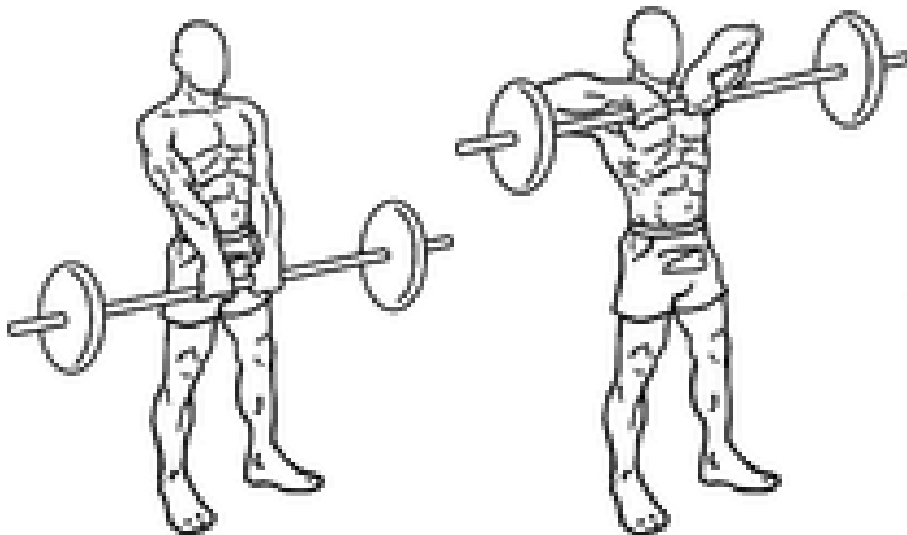


Shrugs

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<http://commons.wikimedia.org/wiki/File:Dumbbell-shrugs-1.png>

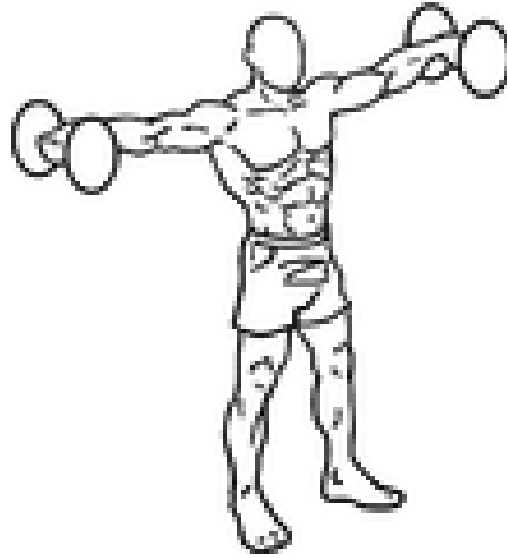
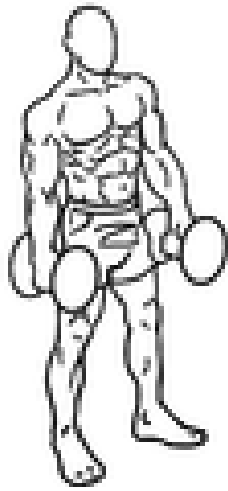
Shoulder Exercises

- Seated Overhead Barbell or Dumbbell Press
- Standing Overhead Barbell or Dumbbell Press
- Overhead Machine Press
- Arnold Press
- Barbell, Dumbbell or Machine Upright Rows
- Dumbbell, Cable or Machine Lateral Raises
- Dumbbell, Cable or Machine Front Raises
- Barbell, Dumbbell, or Machine Rear Deltoid Rows, Raises, or Fly



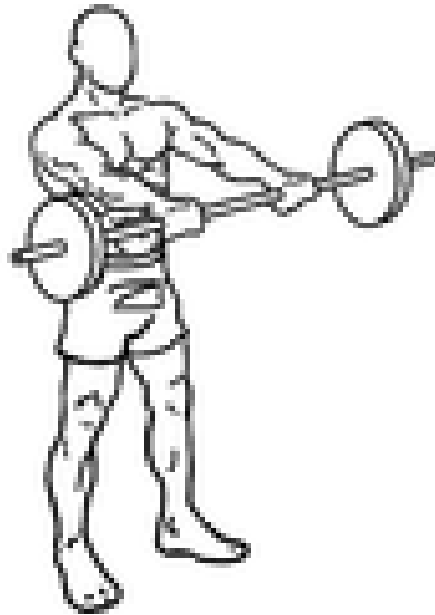
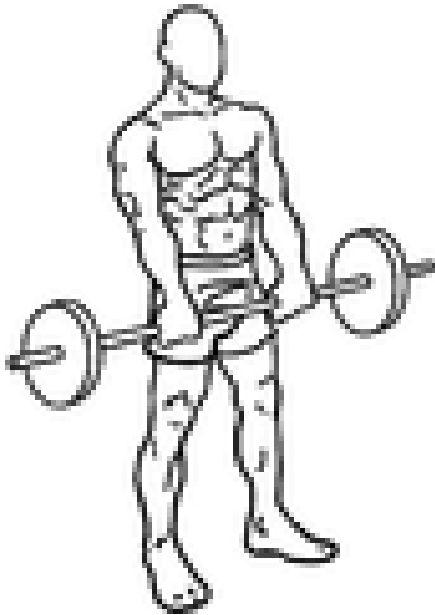
Upright Rows

http://en.m.wikipedia.org/wiki/Upright_rows



Lateral Raises

http://en.m.wikipedia.org/wiki/Lateral_raise

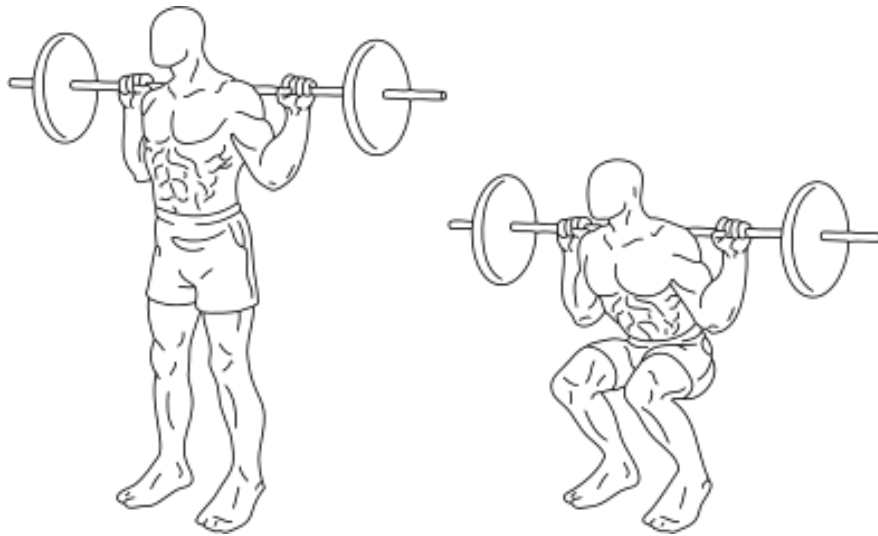


Front Raises

http://en.m.wikipedia.org/wiki/Front_raise

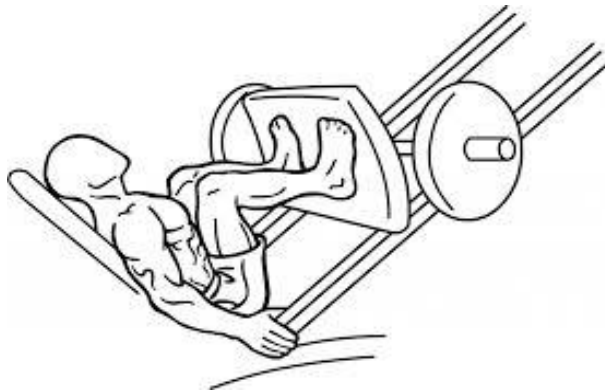
Quadriceps Exercises

- Barbell or Dumbbell Squats
- Barbell or Dumbbell Front Squats
- Barbell or Dumbbell Split Squats
- Barbell or Dumbbell Lunges
- Barbell or Dumbbell Step-Ups
- Leg Press
- Machine Squat/Hack Squat
- Leg Extensions



Squats

[http://en.m.wikipedia.org/wiki/Squat_\(exercise\)](http://en.m.wikipedia.org/wiki/Squat_(exercise))



Leg Press

commons.wikimedia.org



Lunges

<http://commons.wikimedia.org/wiki/File:Lunges-2-1.png>

<http://commons.wikimedia.org/wiki/File:Lunges-2-2.png>



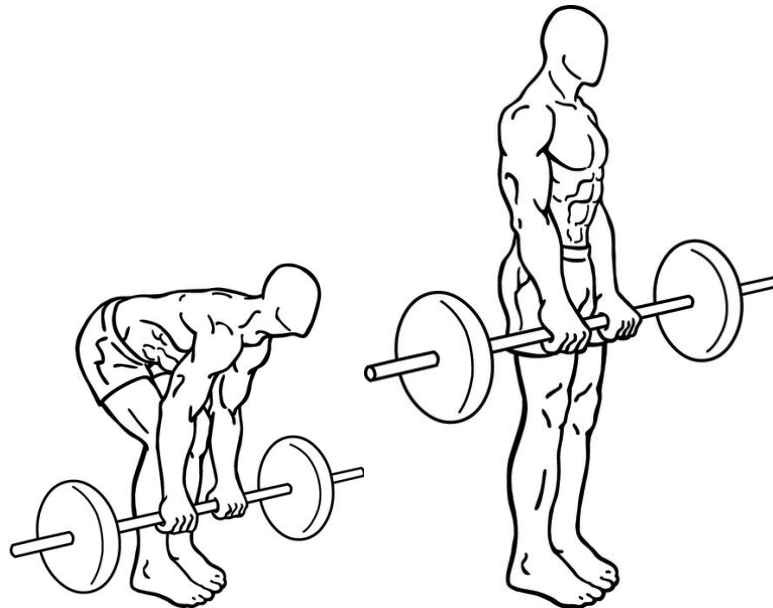
Leg Extensions

<http://commons.wikimedia.org/wiki/File:Leg-extensions-1-672x1024.png>

<http://commons.wikimedia.org/wiki/File:Leg-extensions-2-672x1024.png>

Hamstring Exercises

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- Barbell or Dumbbell Straight Leg Deadlifts
- Barbell or Dumbbell Sumo Deadlifts
- Hyperextensions
- Good-Mornings
- Leg Curls



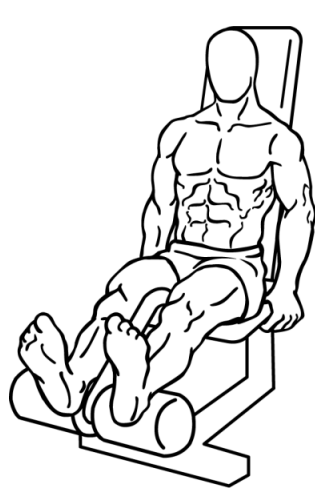
Deadlift

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<http://commons.wikimedia.org/wiki/File:Romanian-deadlift-1.png>



Good-mornings

<http://en.m.wikipedia.org/wiki/Good-morning>



Leg Curls

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<http://commons.wikimedia.org/wiki/File:Seated-leg-curl-1.png>

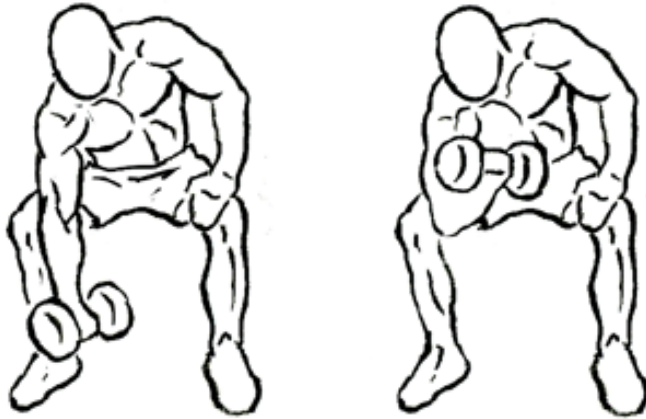
Biceps Exercises

- Standing Barbell or Dumbbell Curls
- Barbell or Dumbbell Preacher Curls
- Seated Dumbbell Curls
- Incline Dumbbell Curls
- Hammer Curls
- Concentration Curls
- Cable Curls
- Biceps Curl Machine



Dumbbell Curls

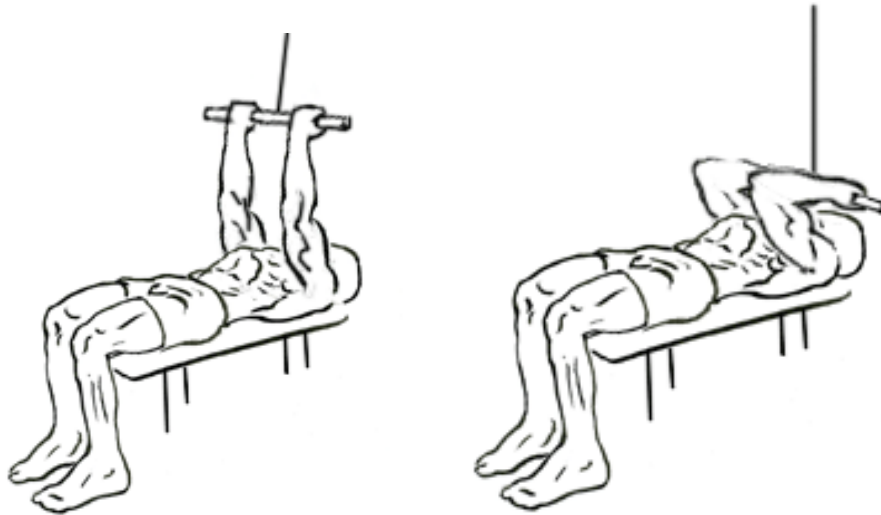
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<http://commons.wikimedia.org/wiki/File:Biceps-curl-2.gif>



Concentration Curls

<http://commons.wikimedia.org/wiki/File:Concentration-curls-1.gif>

<http://commons.wikimedia.org/wiki/File:Concentration-curls-2.gif>



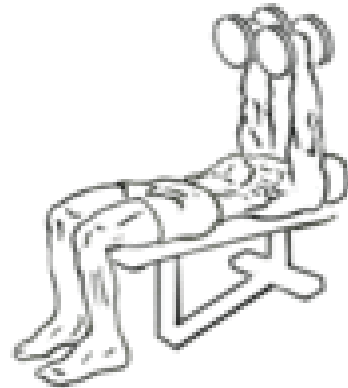
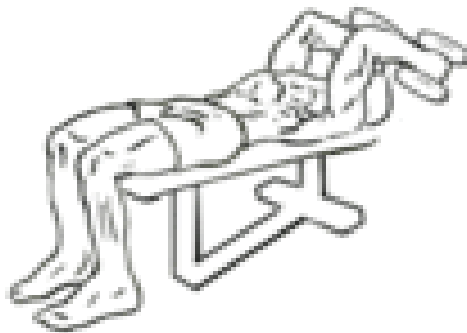
Cable Curls

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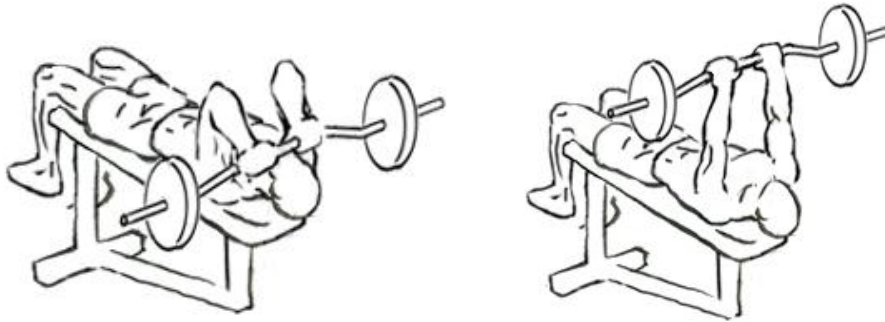
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- Decline Close Grip Bench Press
- Close Grip Push-Ups
- Laying Barbell or Dumbbell Triceps Extensions
- Skull Crushers
- Overhead Barbell or Dumbbell Triceps Extensions
- Cable Press-downs
- Bench Dips



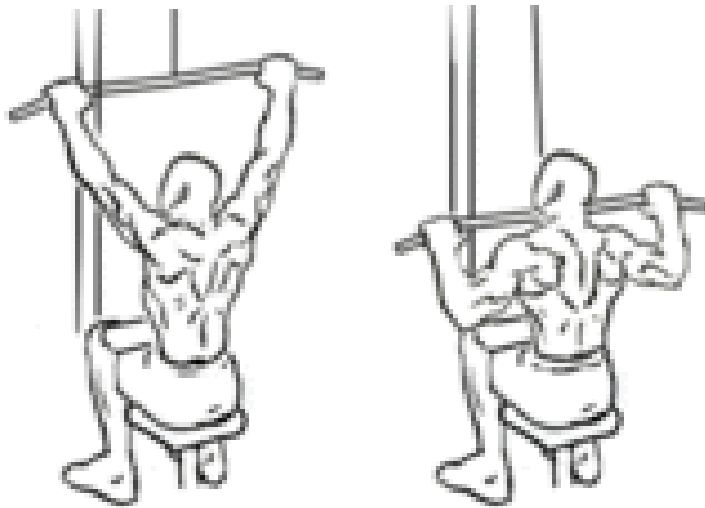
Triceps Extension

<http://commons.wikimedia.org/wiki/File:Decline-triceps-extension-1.gif>
<http://commons.wikimedia.org/wiki/File:Decline-triceps-extension-2.gif>



Skull Crushers

<http://commons.wikimedia.org/wiki/File:Decline-close-grip-bench-to-skull-crusher-1.gif>
<http://commons.wikimedia.org/wiki/File:Decline-close-grip-bench-to-skull-crusher-2.gif>



Cable Pull-downs

http://en.m.wikipedia.org/wiki/Pulldown_exercise

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----- Original Message -----

From: [mailto:emailforms@cdc.gov]

Sent: 11/21/2013 9:34 PM

To: cdcinfo@cdc.gov

Subject: CDC-INFO: Inquiry

Email Address: labattlesot@gmail.com

Hello,

My name is Lauren Battles and I had a question regarding using one of your pictures for a scholarly project. I am currently completing my Master's Degree for Occupational Therapy and am putting together a Scholarly Project with another classmate. We were wondering if we could get an approval from your site to use your healthy food substitutions chart (it's on a printable handout). We have already cited your organization, but need approval to use this chart. Please Let me know as soon as possible,

Thank you,

Lauren Battles

----- Forwarded message -----

From: "CDC-INFO" <cdcinfo@cdc.gov>

Date: Nov 22, 2013 8:17 AM

Subject: RE: CDC-INFO: Inquiry [ref:_00DU0YCBU._500U09rS39:ref]

To: "labattlesot@gmail.com" <labattlesot@gmail.com>

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GK 545

Centers for Disease Control and Prevention: Lifestyle Coach

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Disabled World <admin@disabled-world.com>

Fri 11/22/2013 6:38 AM

To:

Battles, Lauren;

You replied on 11/22/2013 7:32 AM.

On 21-Nov-13 10:51 PM, lauren.battles@my.und.edu wrote:

> name: Lauren Battles

>

> email: lauren.battles@my.und.edu

>

> comments: Hi my name is Lauren Battles and I had a question regarding using one of your pictures for a scholarly project. I am completing my Master's Degree for Occupational Therapy and currently am putting together a Scholarly Project with another classmate. We were wondering if we could get an approval from your site.

> Please Let me know as soon as possible,

>

> thank you,

Lauren Battles

Hi Lauren,

Which picture did you wish to use?

Best Wishes, Ian Langtree

Website: <http://www.disabled-world.com>

Battles, Lauren

Fri 11/22/2013 7:25 AM

Sent Items

Hi Ian,

I wish to use the Color Wheel of Fruits and Vegetables, there is a chart with the foods within the color categories. Would it be possible to use this chart within my Scholarly Project?.

Lauren Battles

lauren.battles@my.und.edu

Occupational Therapy Student

University of North Dakota

"Prepare your minds for what the world has to offer"

Disabled World <admin@disabled-world.com>

Fri 11/22/2013 10:40 AM

To:

Battles, Lauren;

Hi Lauren,

Sure, no problem using that picture.

Best Wishes, Ian Langtree

Website: <http://www.disabled-world.com>

Email: admin@disabled-world.com

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