SPORTS NUTRITION AND HEALTH PROMOTION

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A PROJECT OF THE NATIONAL COUNCIL OF YMCA OF INDIA

NANDANAM, CHENNAI-35

MEC 206
Sports Nutrition and Health Promotion

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Meaning, definition of nutrition, Nutrients sports nutrition diet athletes' diet

Unit II - Sports Nutrition

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Unit V - Health Promotion

Nutrition for the promotion of health Physical exercise for the health promotion

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SPORTS NUTRITION AND HEALTH PROMOTION

Unit I - Introduction

Meaning, definition of nutrition, Nutrients sports nutrition diet athletes' diet

Definition of nutrition

Nutrition is defined as the processes by which an animal or plant takes in and utilises food substances**.** Essential nutrients include protein, carbohydrate, fat, vitamins, minerals and electrolytes. Normally, 85% **of** daily energy use is from fat and carbohydrates and 15% from protein

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What is the definition of sport nutrition and nutrients?

Sports nutrition is the study and implementation of a diet/plan that is designed to increase athletic performance. Best performance is achieved by providing the right amount of food type (protein, carbohydrates, fats, fibre, etc.), fluids and nutrients to maximise energy and aid in sports recovery.

Sports nutrition is a broad interdisciplinary field that focuses on the science behind and application of proper nutrition during exercise.

- The areas of interest are: body's use of nutrients during athletic competition; the need, if any, for nutritional supplements among athletes; and the role of proper nutrition and dietary supplements in enhancing an athlete's performance.
- The psychological dimension of sports nutrition is concerned with eating disorders and other psychiatric conditions related to nutrition among athletes.

Macronutrients

Macronutrients are nutrients that provide calories or energy to the body. The purpose of macronutrients is to promote healthy cellular growth, metabolism, and to maintain normal bodily functions. The macronutrients, as suggested by the name "macro," are needed in the body in large amounts to provide the full and proper effect.

There are three types of macronutrients: carbohydrates, proteins, and lipids Carbohydrates are organic materials composed of hydrogen and oxygen atoms which bond together to form monosaccharides or simple sugar molecules. Carbohydrates are found to form either a simple carbohydrate, composed of one monosaccharide, or a complex (composite) carbohydrate, composed of two or more monosaccharide

molecules. When broken down, both simple and complex carbohydrates form glucose, which is the body's main source of energy. In addition, carbohydrates form an important part of waste elimination and intestinal health, Carbohydrates can be found in most fruits, vegetables and grains and provide the body with 4 calories per gram.

Proteins are nitrogenous organic compounds which are involved with many of the body's most crucial functions including:

- Providing the primary workforce in the cells
- Making hormones and enzymes
- A high involvement with tissue repair.

Proteins also provide energy when there are not enough carbohydrates available as well as sustain lean body mass. Just as carbohydrates are composed of monosaccharides, proteins are composed of chains of amino acid molecules. Also just like carbohydrates, proteins provide the body with 4 calories per gram. Proteins are most commonly found in animal products, nuts, and beans.

Fats which are collectively referred to as triglycerides, are molecules comprised of fatty acids and glycerol. Fats provide essential elements of cell membranes and also provide the body with the ability to absorb fat-soluble vitamins A, D, and E. As fats are the most energy-dense macronutrient, they also provide the highest calorie count, providing the body with 9 calories per gram instead of the 4 provided by one gram of either carbohydrate or protein. The three primary types of fat include:

- Saturated fat
- Unsaturated fat
- Trans fat.

Saturated fat, such as that found in butter and cream, as well as trans-fat, which is found in snack foods and fried foods, have been shown to increase the risk for cardiovascular disease. While in turn, unsaturated fats, which are found in olive oil and canola oil, has been shown to decrease the risk of developing cardiovascular disease.
In regards to athletes, the knowledge of what carbohydrates, proteins, and fats provide the body with will allow them to make the best dietary decisions regarding their performance goals.

Micronutrients

Micronutrients are chemical elements comprised of thirteen organic essential vitamins and seven inorganic minerals. When consumed in the human body, micronutrients play an important role in energy production, haemoglobin synthesis, healthy growth, bone and immune health, and maintain normal metabolism. Despite the importance of maintaining the correct level of these vitamins and minerals in the body, as the name "micro" suggests, these chemical elements are only required to exist in the body in small amounts to provide ample effect.

- The thirteen essential vitamins fall into one of two categories, water-soluble and fat-soluble. The water-soluble vitamins, the eight vitamins which compose the vitamin B complex and vitamin C, must be consumed daily as the body is unable to store what it does not immediately use. In contrast, the fat-soluble vitamins, vitamin K, A, D and E, can be stored in the body's adipose tissue and therefore does not have to be consumed on daily basis to maintain the correct levels in the body.

Minerals are inorganic nutrients that also play a key role in ensuring an athlete's health. The seven minerals needed to maintain accurate energy and hydration levels include:

1. Calcium
2. Iron
3. Zinc
4. Magnesium
5. Sodium
6. Chloride
7. Potassium

These are important because proper hydration prior, during, and after an activity is crucial in the effect on an athlete's performance.

According to multiple sources, the most important vitamins and minerals for athletes include:

- Calcium
- Iron
- Zinc
- Magnesium
- The vitamin B complex
- Vitamins C, D and E due to their role in the efficiency of muscle contraction; both smooth and cardiac muscle.

These vitamins and minerals can be obtained in a wide variety of food or through added supplementation

Nutrients sports nutrition diet athletes' diet
include a wide variety of foods like wholegrain breads and cereals, vegetables (particularly leafy green varieties), fruit, lean meat and low-fat dairy products to enhance long term nutrition habits and behaviours. enable the athlete to achieve optimal body weight and body fat levels for performance.

Whether you are a bodybuilder, a professional athlete or simply exercising to improve your health, sports nutrition plays a key role in optimising the beneficial effects of physical activity. Making better decisions with your nutrition and hydration can result in improved performance, recovery and injury prevention.

Consuming the right balance of food and drink is important for everyone. Yet those actively participating in sport on a regular basis need to be aware that it can also affect their performance. Fats, protein and carbohydrates all provide your body with fuel to maintain energy. Carbohydrates are the primary fuel used by working muscles.

Adequate intake is essential for preventing muscle fatigue. While you should monitor your fat intake, you should not remove it from your diet completely. Fats provide fatty acids that can be used as a source of energy - especially if your exercise sessions last longer than one hour. Fats also provide the building blocks for hormones and formation of cell walls. Protein can be used as a source of energy and is critical for building new muscle tissue. If you are taking part in resistance training, your body will require additional protein.

Diet chart for sportsman

Sunday	
Breakfast (8:00-8:30AM)	Mushroom Paratha 2 + Tomato_chutney+ Scrambled egg(2egg)
Mid-Meal (11:00-11:30AM)	plain Yoghurt with raw vegetables / grilled vegetables -1 cup
Lunch (2:00-2:30PM)	1/2 cup rice + 3 medium chapatti+ Fish masala 1 cup(fish 180 g Oily fish(Salmon, Mackerel, Trout etc))+ Snake guard subji 1/2 cup.
Evening (4:00-4:30PM)	1 cup boiled channa+ light tea 1 cup.
Dinner (8:00-8:30PM)	3 Roti/ chapatti+ 1/2 cup mix veg curry
Monday	
Breakfast (8:00-8:30AM)	Chicken sandwich(4 slice bread) + 1 cup skimmed milk.
Mid-Meal (11:00-11:30AM)	1 banana+ almond milk shake.
Lunch (2:00-2:30PM)	1 cup rice+ Soya chunk curry1/2 cup+ Ladies finger subji 1/2 cup+ small cup low fat curd.
Evening (4:00-4:30PM)	Brown rice flakes poha with nuts 1 cup.
Dinner (8:00-8:30PM)	3 Roti / chappathi+Ridge guard subji 1/2 cup.
Tuesday	
Breakfast (8:00-8:30AM)	Soya flour Uthappam 2 +Tomato /green chutney + 1 glass skimmed milk.
Mid-Meal (11:00-11:30AM)	1 cup boiled channa
Lunch (2:00-2:30PM)	4 chapati+ Grilled chicken 150 gm+ Dhal 1/2 cup+ cucumber salad 1/2 cup.

Evening (4:00-4:30PM)	1 cup blue berry milk shake
Dinner (8:00-8:30PM)	Brocken wheat upma 1 cup+ 1/2 cup green beans subji
Wednesday	
Breakfast (8:00-8:30AM)	4 Idli + Sambar 1/2 cup+1 table spoon Gren chutney/ Tomato Chutney+ 2 egg white
Mid-Meal (11:00-11:30AM)	1 Portion fruit salad+ Cottage cheese.
Lunch (2:00-2:30PM)	Veg pulav rice 1.5 cup+ 1 cup Soya Chunk curry+ 1/2 cup Low fat curd.
Evening (4:00-4:30PM)	Chicken salad 1 cup.
Dinner (8:00-8:30PM)	3 roti/ Chapatti+ Ladies finger subji 1/2 cup.
Thursday	
Breakfast (8:00-8:30AM)	chappati-4+ Egg roast 1/2 cup 2 egg
Mid-Meal (11:00-11:30AM)	green gram sprouts 1 cup
Lunch (2:00-2:30PM)	4 Roti+1/2 cup salad + Fish curry (fish 180 g Oily fish(Salmon, Mackerel, Trout etc))+ 1/2 cup cabbage subji.
Evening (4:00-4:30PM)	1 Portion fruit + cottage cheese
Dinner (8:00-8:30PM)	3 Roti / chapatti.+ Tomato subji 1/2 cup.
Friday	
Breakfast (8:00-8:30AM)	Chicken keema Paratha 2+ 1 tbs green chutney+ 1 glass skim milk.
Mid-Meal (11:00-11:30AM)	1 Portion fruit salad+ Cotage cheese.

Lunch (2:00-2:30PM)	1.5 cup rice+Kidney beans curry 1 cup + 1/2 cup cucumber salad+ Ladies finger subji 1/2 cup.
Evening (4:00-4:30PM)	Brown rice flakes poha with nuts 1 cup.
Dinner (8:00-8:30PM)	Wheat dosa 3 + 1 cup Bitter guard subji.
Saturday	
Breakfast (8:00-8:30AM)	Sprouts & Paneer Paratha 3+ Green chutney.
Mid-Meal (11:00-11:30AM)	1 cup boilled channa
Lunch (2:00-2:30PM)	4 chapati+ Grilled chicken 150 gm+ Dhal 1/2 cup+ cucumber salad 1/2 cup.
Evening (4:00-4:30PM)	1 cup blue berry milk shake
Dinner (8:00-8:30PM)	Brocken wheat upma 1 cup+ 1/2 cup green beans subji

Do's And Don’ts

Do's

- Eat adequate high carbohydrate meals every day to keep glycogen stores full and make most of your training sessions.
- Allow 3-4 hours digestion time for a large meal, 2-3 for smaller meal, 1-2 for blended or liquid meals and less than one hour for smaller snacks
- If you eat less than one hour before the event be sure to snack on any tried and true low fat high carbohydrate snack
- It's best to have high glycemic index foods during and after exercise such as Glucose, Potatoes, Bagels, Raisins, Oatmeal, Sugar etc

Don'ts

1. Dehydrate your body.
2. Maintain proper balance of intake and output.

3. Balance your protein and carb intake wisely.
4. Alcohol & smoking should be avoided totally.

Food Items You Can Easily Consumed By Sports Person

1. Cereals: Brown rice, Oat meal, Brocken wheat, Ragi, Maiz grit, Sweet corn.
2. Pulses: Chickpeas, Kidney beans, moong dal, masoor dal, soybeans.
3. Vegetables: Broccoli, Kale, Spinach, Lettuce, Beet, Potatoes, Carrots, Sweet potatoes, Beans and all other vegetables(especially the green ones such as spinach, lettuce, leeks, broccoli, asparagus, peas, cabbage and beans, are high in minerals, calcium, iron and other vitamins)
4. Fruits: Avacado, Banana, Custard Apple, Pears, Grape and Watermelon, Oranges and Apple (sweet corn, bananas are good for carbohydrate loading before even)
5. Milk and Milk products: Skim milk, Paneer, Cottage Cheese, Yoghurt.
6. Meat, Fish and Egg: Lean Meat, Chicken Brest, Tuna, Salmon, Tilapia, Sword fish , Cod.
7. Oil: 1.5 Tbsp/ day(Olive oil, Mustard Oil, Rice bran Oil, Canola oil
8. Sugar: 2 Tsp/ day.

Unit II - Sports Nutrition

Food pyramid - Diet chart for specific sports and specific diseases –Nutrition labeling information, Food Choices, Food Guide Pyramid, Influences on food choices-social, economic, cultural, food sources, Comparison of food values.

Food pyramid

The Healthy Eating Food Pyramid

Balanced diet is a key to stay healthy. Follow the "Healthy Eating Food Pyramid" guide as you pick your food. Grains should be taken as the major dietary source. Eat more fruit and vegetables. Have a moderate amount of meat, fish, egg, milk and their alternatives. Reduce salt, fat/ oil and sugar. Trim fat from meat before cooking. Choose low-fat cooking methods such as

steaming, stewing, simmering, boiling, scalding or cooking with non-stick frying pans. Also reduce the use of frying and deep-frying. These can help us achieve balanced diet and promote health.

How much of different kinds of food should I eat to stay healthy?

Eat the Right Food

Since different foods have different nutritional values, it is not possible to obtain all the nutrients we need from a single food. According to the Healthy Eating Food Pyramid, we have to eat a variety of foods among all food groups as well as within each group in order to get different nutrients and meet our daily needs.

Eat the Right Amount

Neither eating too much nor too little is good for our health. Every day, we need a specific amount of nutrients to maintain optimal health. If we do not eat enough, under-nutrition and symptoms of deficiency are likely to develop; while over-nutrition and obesity can be resulted when we consume an excessive amount of any type of food. Therefore, we have to eat right amount of food to stay healthy.

Healthy Eating Food Pyramid

- Eat Most - Grains
- Eat More - Vegetables and fruits
- Eat Moderately - Meat, fish, egg and alternatives (including dry beans) and milk and alternatives
- Eat Less - Fat/ oil, salt and sugar
- Drink adequate amount of fluid (including water, tea, clear soup, etc) every day

Healthy Eating Food Pyramid for Children (aged 2 to 5)

- Grains: 1.5 - 3 bowls
- Vegetables: at least 1.5 servings
- Fruits: at least 1 serving
- Meat, fish, egg and alternatives: 1.5 - 3 taels
- Milk and alternatives: 2 servings
- Fat/oil, salt and sugar: eat the least
- Fluid: 4 - 5 glasses

Healthy Eating Food Pyramid for Children (aged 6 to 11)

- Grains: 3 - 4 bowls

- Vegetables: at least 2 servings
- Fruits: at least 2 servings
- Meat, fish, egg and alternatives: 3 - 5 taels
- Milk and alternatives: 2 servings
- Fat/oil, salt and sugar: eat the least
- Fluid: 6 - 8 glasses

Healthy Eating Food Pyramid for Teenagers (aged 12 to 17)

- Grains: 4 - 6 bowls
- Vegetables: at least 3 servings
- Fruits: at least 2 servings
- Meat, fish, egg and alternatives: 4 - 6 taels
- Milk and alternatives: 2 servings
- Fat/oil, salt and sugar: eat the least
- Fluid: 6 - 8 glasses

Healthy Eating Food Pyramid for Adults

- Grains: 3 - 8 bowls
- Vegetables: at least 3 servings
- Fruits: at least 2 servings
- Meat, fish, egg and alternatives: 5 - 8 taels
- Milk and alternatives: 1 - 2 servings
- Fat/oil, salt and sugar: eat the least
- Fluid: 6 - 8 glasses

Healthy Eating Food Pyramid for Elderly

- Grains: 3 - 5 bowls
- Vegetables: at least 3 servings
- Fruits: at least 2 servings
- Meat, fish, egg and alternatives: 5 - 6
- Milk and alternatives: 1 - 2 servings
- Fat/oil, salt and sugar: eat the least
- Fluid: 6 - 8 glasses

Food Exchange List:

1 bowl of grains is equivalent to:

- Cooked rice, 1 bowl

- Cooked noodles, $1\frac{1}{4}$ bowls
- Bread, 2 slices

1 serving of vegetables is equivalent to:

- Cooked vegetables, $\frac{1}{2}$ bowl
- Raw vegetables, 1 bowl

1 serving of fruit is equivalent to:

- Medium-sized apple, 1 piece
- Kiwi, 2 pieces
- Fruit cuts, $\frac{1}{2}$ bowl

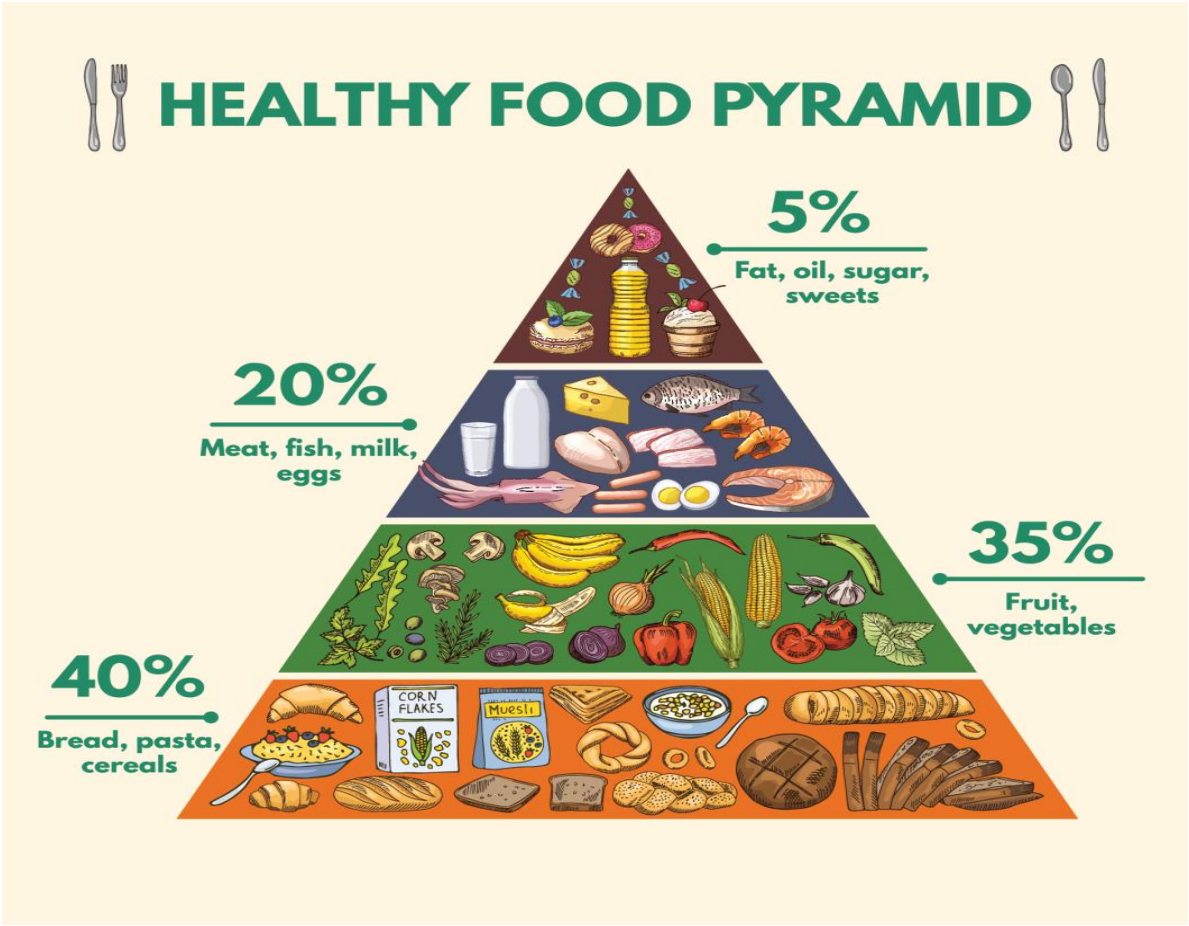
1 table of meat is equivalent to:

- Cooked meat, 4-5 slices
- Egg, 1 piece
- Silky tofu, 1 piece

1 serving of milk and alternatives is equivalent to:

- Low-fat milk, 1 cup
- Low-fat cheese, 2 slices
- Low-fat plain yogurt, 1 pot (150g)


SPORTS NUTRITION PYRAMID
FATS, OILS & SWEETS
USE SPARINGLY
Provides calories but few vitamins and minerals
MILK, YOGURT & CHEESE Group
2-4 Servings
Packed with bone-strengthening calcium, high-quality protein and essential electrolytes like potassium that help regulate fluid balance
MEAT, POULTRY, FISH, DRY BEANS, EGGS & NUTS Group
2-3 Servings
Provides muscle-building protein and vital vitamins and minerals like iron
VEGETABLE Group
3-5 Servings
Chock-full of fiber and essential nutrients such as vitamin A
FRUIT Group
2-4 Servings
Offers an endless array of nutrients including potassium and disease-fighting antioxidants such as vitamin C
BREAD, CEREAL, RICE & PASTA Group
6-11 Servings
Provides your body's main source of energy to fuel your activity
WATER*
8 Servings or More
Keeps you hydrated and cool so you can keep moving
A GUIDE TO DAILY FOOD CHOICES FOR ACTIVE PEOPLE


HEALTHY FOOD PYRAMID
5%
Fat, oil, sugar, sweets
20%
Meat, fish, milk, eggs
35%
Fruit, vegetables
40%
Bread, pasta, cereals
CORN FLAKES
Muesli

What is sports specific diet?

An athlete's diet should be similar to that recommended for the general public, with energy intake divided into:

- 45 to 65% from carbohydrates.
- 15 to 25% from protein.
- 20 to 35% from fat.

CARBOHYDRATES

Determine the number of grams of carbs you need each day by calculating 45 to 65 percent of your total calorie intake, and dividing by 4. For example, if you eat a 2,000-calorie diet, shoot for 225 to 325 grams of carbs per day; and if you eat 2,500 calories a day, aim for 281 to 406 grams of carbs.

How to calculate my carbohydrate needs with a calculator

Using a Carbohydrate Calculator can be smooth if you know the steps. Let's break it down for you.

Step 1: Visit a CC webpage online. Experts recommend sticking with government portals to ensure accuracy.

Step 2: Enter your information like age, gender, weight, height, and activity levels. Your activity levels can be sedentary, lightly active, moderately active, or very active-depending on the amount of time you spend being physically active, the intensity of your physical activity, your job profile, and your hobbies.

Step 3: Click on the calculate button and sit back. The calculator will display your recommended daily intake of carbohydrates in a few seconds.

Interpreting values in a Carbohydrate calculator

Carbohydrates should account for 45 to 65% of total daily calories. This indicates that on a 2,000-calorie diet, you should have 900 to 1,300 calories from carbs. This equates to consuming 225 to 325 grams of carbs per day.

Carbohydrate calculators can be the first step towards empowering your health journey. While they should not be seen as substitutes for professional advice, these calculators can be relied upon as your “go-to” companions on your quest for healthier eating habits. Embrace carbohydrate calculators, seize control of your nutritional choices, and chart a course toward a happy and healthy life.

Calculate protein requirement by weight

Another way to calculate your minimum daily protein requirement is by:

- Dividing your weight into pounds by 20 and multiplying it by seven.
    - You need just a little more than seven grams of protein for every 20 pounds of your body weight.
    - Thus, for someone weighing 200 pounds, the protein requirement will be 70 grams each day.
- You can also determine your protein requirement by multiplying your weight in pounds by 0.36.
    - Thus, for an adult weighing 150 pounds, the approximate protein requirement will be 54 grams.

Calculate protein requirement by calorie intake

Another way to calculate your daily protein requirement is by knowing how many calories you need in a day.

- The National Academy of Medicine recommends that an individual can get anywhere from 10 to 35 percent of calories each day from protein.
    - One gram of protein gives four kilocalories.
    - Thus, a person consuming 2000 calories a day can derive 200 to 700 calories from protein.
    - This means they can eat about 50 to 125 grams of protein a day.

Calculating Calories and Fat Grams
To determine the number of calories and fat grams you need each day to lose, maintain, or gain weight, ask your healthcare provider or a registered dietitian. As a general guideline, to maintain your current weight, follow the three-step formula below. Remember, everyone's body and metabolism are different, so these numbers could vary slightly for you and can change over time.

1. Determine your estimated calorie needs in the chart below:

Physical Activity Level				
Gender	**Age (years)**	**Inactive (Sedentary)**	**Moderately Active**	**Active**
Female	**19–30**	**1,800–2,000**	**2,000–2,200**	**2,400**
	31–50	**1,800**	**2,000**	**2,200**

	51+	**1,600**	**1,800**	**2,000–2,200**
Male	**19–30**	**2,400–2,600**	**2,600-2,800**	**3,000**
	31–50	**2,200–2,400**	**2,400–2,600**	**2,800–3,000**
	51+	**2,000–2,200**	**2,200–2,400**	**2,400–2,800**

2. No more than 30% of calories should be from fat, so take the total calories and multiply by 30%.

____calories per day x 0.30 = ____ calories from fat per day.

3. Because there are 9 calories in each gram of fat, take calories from fat per day and divide by 9.

____calories from fat per day divided by 9 = ____fat grams per day.

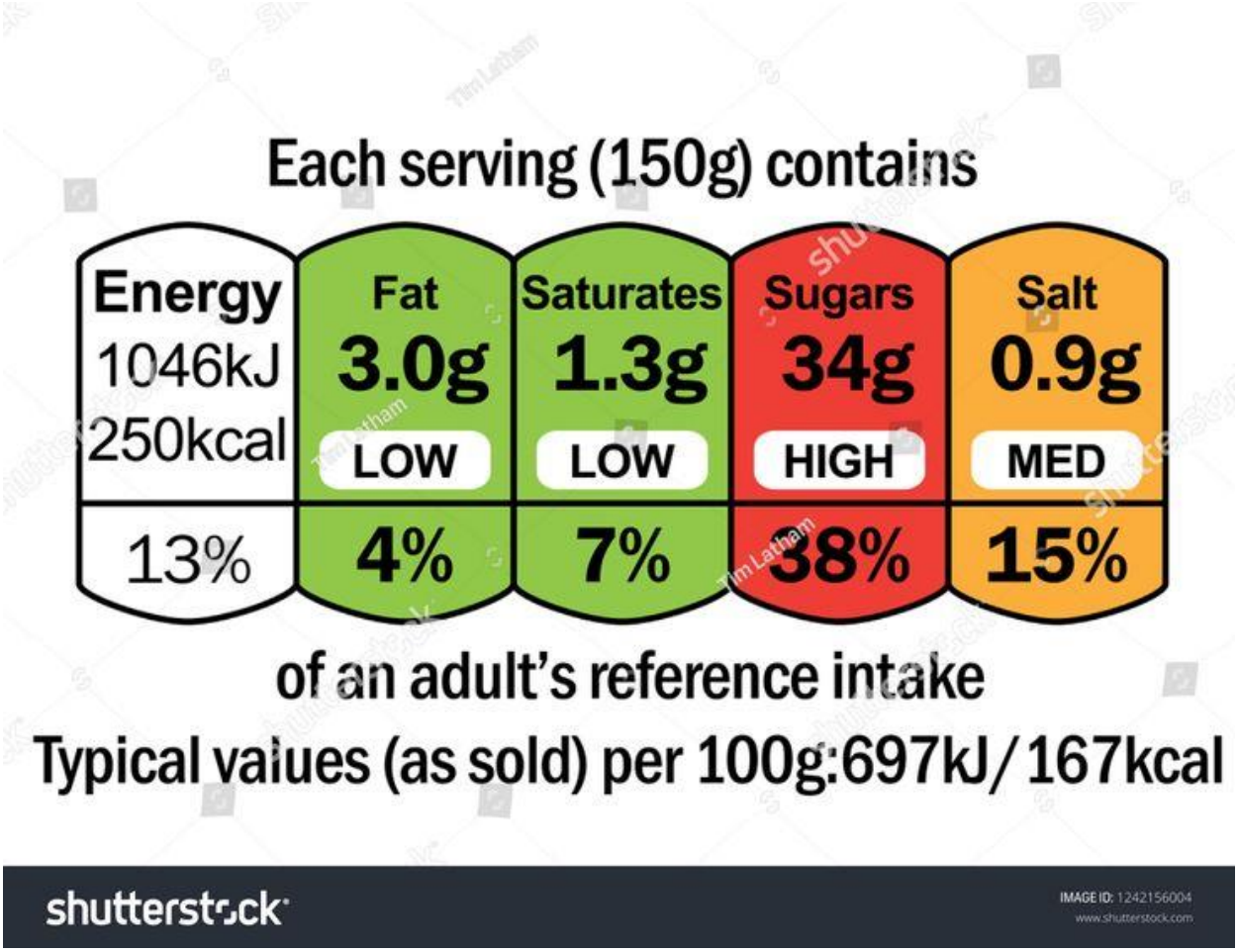
Remember, saturated fats should account for only 10% of the total fat grams eaten.

What is called Labeling?

Labeling or using a label is describing someone or something in a word or short phrase. For example, the label "criminal" may be used to describe someone who has broken a law. Labeling theory is a theory in sociology which ascribes labeling of people to control and identification of deviant behavior.

What is nutrition Labelling information?

Nutrition labels describe the nutrient content of a food and are intended to guide the consumer in food selection. The nutrition information provided must be selected on the basis of consistency with dietary recommendations.
What are nutrition information labels on food?



It shows you some key nutrients that impact your health. You can use the label to support your personal dietary needs – look for foods that contain more of the nutrients you want to get more of and less of the nutrients you may want to limit. Nutrients to get less of: Saturated Fat, Sodium, and Added Sugars.

What is the purpose of Labelling?

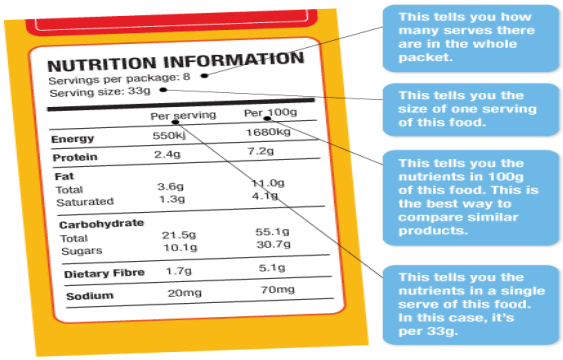
Labelling is an important part of the marketing of a product. Labelling is essential as it helps to grab the attention of a customer It can be combined with packaging and can be used by marketers to encourage potential buyers to purchase the product. Packaging is also used for convenience and information transmission.

What are the 4 types of labelling?

There are four major types of labels that companies and small businesses are using for their products and operations: brand labels, informative labels, descriptive labels, and grade labels.

It provides information like- name of the product, name of the manufacturer, contents of product, expiry and manufacturing date, general instructions etc.

- Helps is describing the product and specify its content.
- It gives identification to the product.



- Helps in grading the product.

A

Nutrition Facts

8 servings per container

Serving size **2/3 cup (55g)**

Amount per serving

Calories **230**

	% Daily Value*
Total Fat 8g	**10%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 160g	**7%**
Total Carbohydrate 37g	**13%**
Dietary Fiber 4g	**14%**
Total Sugars 12g	
Includes 10g Added Sugars	**20%**
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 240mg	6%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

B

Nutrition Facts

2 servings per container

Serving size **1 cup (255g)**

	Per serving		Per container	
Calories	**220**		**440**	
		% DV*		% DV*
Total Fat	5g	**6%**	10g	**13%**
Saturated Fat	2g	**10%**	4g	**20%**
Trans Fat	0g		0g	
Cholesterol	15mg	**5%**	30mg	**10%**
Sodium	240mg	**10%**	480mg	**21%**
Total Carb.	35g	**13%**	70g	**25%**
Dietary Fiber	6g	**21%**	12g	**43%**
Total Sugars	7g		14g	
Incl. Added Sugars	4g	**8%**	8g	**16%**
Protein	9g		18g	
Vitamin D	5mcg	25%	10mcg	50%
Calcium	200mg	15%	400mg	30%
Iron	1mg	6%	2mg	10%
Potassium	470mg	10%	940mg	20%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

The Factors That Influence Our Food Choices:

1. Major determinants of food choice

The key driver for eating is of course hunger but what we choose to eat is not determined solely by physiological or nutritional needs. Some of the other factors that influence food choice include:

- Biological determinants such as hunger, appetite, and taste
- Economic determinants such as cost, income, availability
- Physical determinants such as access, education, skills (e.g. cooking) and time
- Social determinants such as culture, family, peers and meal patterns
- Psychological determinants such as mood, stress and guilt
- Attitudes, beliefs and knowledge about food

The complexity of food choice is obvious from the list above, which is in itself not exhaustive. Food choice factors also vary according to life stage and the power of one factor will vary from one individual or group of people to the next. Thus, one type of intervention to modify food choice behaviour will not suit all population groups. Rather, interventions need to be geared towards different groups of the population with consideration to the many factors influencing their decisions on food choice.

1.1 Biological determinants of food choice

Hunger and satisfying
Our physiological needs provide the basic determinants of food choice. Humans need energy and nutrients in order to survive and will respond to the feelings of hunger and satiety (satisfaction of appetite, state of no hunger between two eating occasions). The central nervous system is involved in controlling the balance between hunger, appetite stimulation and food intake.

The macro-nutrients i.e. carbohydrates, proteins and fats generate satiety signals of varying strength. The balance of evidence suggests that fat has the lowest satiating power, carbohydrates have an intermediate effect and protein has been found to be the most satiating.

The energy density of diets has been shown to exert potent effects on satiety; low energy density diets generate greater satiety than high energy density diets. The high energy density of high-fat and/or high-sugar foods can also lead to ‘passive overconsumption’, where excess energy is ingested unintentionally and without the consumption of additional bulk.

An important satiety signal may be the volume of food or portion size consumed. Many people are unaware of what constitutes appropriate portion sizes and thus inadvertently consume excess energy.

Tastiness
Palatability is proportional to the pleasure someone experiences when eating a particular food. It is dependent on the sensory properties of the food such as taste, smell, texture and appearance. Sweet and high-fat foods have an undeniable sensory appeal. It is not surprising then that food is not solely regarded as a source of nourishment but is often consumed for the pleasure value it imparts.

The influence of palatability on appetite and food intake in humans has been investigated in several studies. There is an increase in food intake as palatability increases, but the effect of palatability on appetite in the period following consumption is unclear. Increasing food variety can also increase food and energy intake and in the short term alter energy balance[45]. However, effects on long-term energy regulation are unknown.

Sensory aspects

'Taste' is consistently reported as a major influence on food behaviour. In reality 'taste' is the sum of all sensory stimulation that is produced by the ingestion of a food. This includes not only taste per se but also smell, appearance and texture of food. These sensory aspects are thought to influence, in particular, spontaneous food choice.

From an early age, taste and familiarity influence behaviour towards food. A liking for sweetness and a dislike for bitterness are considered innate human traits, present from birth[48]. Taste preferences and food aversions develop through experiences and are influenced by our attitudes, beliefs and expectations[9].

2. Economic and physical determinants of food choice

Cost and accessibility

There is no doubt that the cost of food is a primary determinant of food choice. Whether cost is prohibitive depends fundamentally on a person's income and socio-economic status. Low-income groups have a greater tendency to consume unbalanced diets and in particular have low intakes of fruit and vegetables. However, access to more money does not automatically equate to a better quality diet but the range of foods from which one can choose should increase.

Accessibility to shops is another important physical factor influencing food choice, which is dependent on resources such as transport and geographical location. Healthy food tends to be more expensive when available within towns and cities compared to supermarkets on the outskirts[19]. However, improving access alone does not increase purchase of additional fruit and vegetables, which are still regarded as prohibitively expensive.

Education and Knowledge

Studies indicate that the level of education can influence dietary behaviour during adulthood[30]. In contrast, nutrition knowledge and good dietary habits are not strongly correlated. This is because knowledge about health does not lead to direct action when individuals are unsure how to apply their knowledge. Furthermore, information disseminated on nutrition comes from a variety of sources and is viewed as conflicting or is mistrusted, which discourages motivation to change[15]. Thus, it is important to convey accurate and consistent messages through various media, on food packages and of course via health professionals.

3. Social determinants of food choice

Influence of social class

What people eat is formed and constrained by circumstances that are essentially social and cultural. Population studies show there are clear differences in social classes with regard to food and nutrient intakes. Poor diets can result in under- (micronutrients deficiency) and over-nutrition (energy over consumption resulting in overweight and obesity); problems that face different sectors of society, requiring different levels of expertise and methods of intervention.

Cultural influences

Cultural influences lead to the difference in the habitual consumption of certain foods and in traditions of preparation, and in certain cases can lead to restrictions such as exclusion of meat and milk from the diet. Cultural influences are however amenable to change: when moving to a new country individuals often adopt particular food habits of the local culture.

Social context

Social influences on food intake refer to the impact that one or more persons have on the eating behaviour of others, either direct (buying food) or indirect (learn from peer's behaviour), either conscious (transfer of beliefs) or subconscious. Even when eating alone, food choice is influenced by social factors because attitudes and habits develop through the interaction with others. However, quantifying the social influences on food intake is difficult because the influences that people have on the eating behaviour of others are not limited to one type and people are not necessarily aware of the social influences that are exerted on their eating behaviour[23].

Social support can have a beneficial effect on food choices and healthful dietary change[16]. For example, social support has been found to be a strong predictor for fruit and vegetable consumption among adults.[46] Social support may enhance health promotion through fostering a sense of group belonging and helping people to be more competent and self-efficacious[8].

The family is widely recognised as being significant in food decisions. Research shows the shaping of food choices taking place in the home. Because family and friends can be a source of encouragement in making and sustaining dietary change, adopting dietary strategies which are acceptable to them may benefit the individual whilst also having an effect on the eating habits of others[3].

Social setting

Although the majority of food is eaten in the home, an increasing proportion is eaten outside the home, e.g. in schools, at work and in restaurants. The venue in which food is eaten can affect food choice, particularly in terms of what foods are on offer. The availability of healthy food at home and 'away from home' increases the consumption of such foods. However, access to healthy food options is limited in many work/school environments. This is particularly true for

those with irregular hours or with particular requirements, e.g. vegetarian[22]. With the majority of adult women and men in employment, the influence of work on health behaviours such as food choices is an important area of investigation[16].

4 Meal patterns

People have many different eating occasions daily, the motivations for which will differ from one occasion to the next. Most studies investigate the factors that influence habitual food choice but it may be useful to investigate what influences food choice at different eating occasions.

The effects of snacking on health have been debated widely. Evidence shows that snacking can have effects on energy and nutrient intakes but not necessarily on body mass index[28]. However, individuals with normal weight or overweight may differ in their coping strategies when snack foods are freely available and also in their compensatory mechanisms at subsequent meals. Moreover, snack composition may be an important aspect in the ability of individuals to adjust intake to meet energy needs.

Helping young adults to choose healthy snack choices poses a challenge to many health professionals. In the home, rather than forbidding unhealthy snacks, a more positive approach may be the introduction of healthy snack options over time. Moreover, healthy food choices outside the home also need to be made more readily available.

5 Psychological factors

Stress

Psychological stress is a common feature of modern life and can modify behaviours that affect health, such as physical activity, smoking or food choice.

The influence of stress on food choice is complex not least because of the various types of stress one can experience. The effect of stress on food intake depends on the individual, the stressor and the circumstances. In general, some people eat more and some eat less than normal when experiencing stress

The proposed mechanisms for stress induced changes in eating and food choice are motivational differences (reduced concern about weight control), physiological (reduced appetite caused by the processes associated with stress) and practical changes in eating opportunities, food availability and meal preparation.

Studies also suggest that if work stress is prolonged or frequent, then adverse dietary changes could result, increasing the possibility of weight gain and consequently cardiovascular risk.

Mood

Hippocrates was the first to suggest the healing power of food, however, it was not until the middle ages that food was considered a tool to modify temperament and mood. Today it is recognised that food influences our mood and that mood has a strong influence over our choice of food.

Interestingly, it appears that the influence of food on mood is related in part to attitudes towards particular foods. The ambivalent relationship with food – wanting to enjoy it but conscious of weight gain is a struggle experienced by many. Dieters, people with high restraint and some women report feeling guilty because of not eating what they think they should. Moreover, attempts to restrict intake of certain foods can increase the desire for these particular foods, leading to what are described as food cravings.

Women more commonly report food cravings than do men. Depressed mood appears to influence the severity of these cravings. Reports of food cravings are also more common in the premenstrual phase, a time when total food intake increases and a parallel change in basal metabolic rate occurs.

Thus, mood and stress can influence food choice behaviour and possibly short and long term responses to dietary intervention.

COMPARISON OF FOOD VALUES.

What is the values of food?

The food value of a particular food is a measure of how good it is for you, based on its level of vitamins, minerals, or calories.

What are examples of food values?

Values are reported for water; calories; protein; total fat; saturated, monounsaturated, and polyunsaturated fatty acids; cholesterol; carbohydrate; total dietary fiber; calcium; iron; potassium; sodium; vitamin A in IU and RE units; thiamin; riboflavin; niacin; and ascorbic acid (vitamin C).

What are the five food groups?

- Fruit and vegetables.
- Starchy food.
- Dairy.
- Protein.
- Fat.

What are the seven components of food ?

- There are seven essential factors for a balanced diet: carbs, protein, fat, fibre, vitamins, minerals and water.

Comparison of nutrient values of different vegetables

Vegetable	Energy (kcal)	Protein (g)	Fat (g)	Calcium (g)	Iron (g)	B-carotene* (µg)	Vitamin C (mg)
Amaranth	41.4	3.6	0.8	393.9	3.2	617.5	76.5
Blackjack	36.8	3.4	0.7	154.8	6.1	69.0	61.0
Cabbage boiled	19.7	1.4	0.2	45.1	0.4	8.6	34.2
Cabbage raw	25.0	1.6	0.2	47.7	0.7	11.2	44.9
Carrot	28.3	0.8	0.2	34.0	0.5	2825.5	5.4
Okra	31.1	2.0	0.2	76.9	1.0	115.7	25.7
Onion	40.6	1.3	0.2	29.3	1.4	4.4	9.2
Pumpkin leaves	41.1	4.6	0.5	259.5	4.3	343.3	99.2
Pumpkin pulp	28.8	1.0	0.1	25.0	0.9	497.2	0.1
Rape	48.0	4.1	0.4	370.0	6.7	120.4	107.5
Spinach	22.7	2.9	0.3	92.9	2.2	2429.3	27.9

* from Vitamin A

What is the value of healthy food?

A healthy diet is essential for good health and nutrition. It protects you against many chronic non-communicable diseases, such as heart disease, diabetes and cancer. Eating a variety of foods and consuming less salt, sugars and saturated and industrially-produced trans-fats, are essential for healthy diet.

Unit III – Weight Management

Weight Management-proper practices to maintain, lose and gain. Eating Disorders, Proper hydration, the effects of performance enhancement drugs Lipoproteins, cholesterol, phospholipids and triglycerides,

Definition of Weight management?

Weight management refers to behaviors, techniques, and physiological processes that contribute to a person's ability to attain and maintain a healthy weight. Most weight management techniques encompass long-term lifestyle strategies that promote healthy eating and daily physical activity

Why is weight management important?

It Protects You From Weight-Related Diseases.
Some of these diseases and health conditions include
Sleep apnea
High blood pressure
Diabetes
Cancer
Heart disease
Stroke
Osteoarthritis and other negative health conditions.

Losing weight is one of the easiest ways to improve your health

How to manage weight loss?

Weight loss: 6 strategies for success

1. 1. Make sure you're ready. Long-term weight loss takes time and effort — and a long-term commitment
2. Find your inner motivation. No one else can make you lose weight
3. Set realistic goals
4. Enjoy healthier foods
5. Get active, stay active

The Energy Balance

The calories you do not use are stored as body fat. This is true whether these calories came from fats, carbohydrates, proteins. Use more calories by increasing physical activity. Manage your weight by balancing what you eat and drink with how active you are. Maintain by balancing. Tip the scale to lose or gain!

DIETARY AND CALORIES CALCULATED

A calorie is a scientific measurement, used in determining the energy produced by a unit. A dietary calorie is used to measure the output of energy in food, and can be helpful in setting daily limits of food that can be successfully burned by the body. A dietary calorie is equal to 1000 small calories, and will raise the temperature of one kilogram of water one degree C (1.8 ° F.) Dietary calories contained in food are often initially determined by measuring the energy output in a calorimeter.

The understanding of dietary calories is important in determining what comprises a sustainable diet. Unlike animals, which generally eat whatever is nearby and are often drawn to necessary nutrition, humans can consume a wide variety of substances that are completely unnecessary to provide nutrition and energy.

With obesity rates skyrocketing in the 21st century, it is clear that many people do not understand what constitutes enough food or correct food to sustain the body and provide it with a correct level of energy. Determining the amount of dietary calories in foods is the first step to determining the correct amount of food that should be consumed, based on current weight, activity level, and health status. Now more than ever, correct calculation of dietary calories by the Atwater system and calorimeters is necessary to ensure the health of human beings.

GUIDELINES TO LOSE WEIGHT

Dieting alone is not a successful strategy for weight loss or weight control. There is a clear relationship between physical activity and measures of body composition such as waist to hip ratio, waist circumference and body fat. Low levels of physical activity are associated with poor diet and obesity, which may in turn be a barrier to being active. Inactivity is one of the main concern in relation to healthy weight and imparting physical activity is a key component for weight loss and weight maintenance. Here are the guidelines to lose weight:-

- The best way to lose weight is slowly, by making small, achievable changes to your eating and exercise habits.
- Avoid foods that are high in sugars which contribute to increased body mass.
- Cut down on dietary fats, especially saturated fat and choose low fat varieties.
- Increase your intake of fresh fruits, vegetables, and whole grain breads and cereals.
- Exercise for approximately 30 minutes on most days of the week. Introduce more movement into your day. Try to include 30 minutes of walking daily

BENEFITS OF PHYSICAL ACTIVITY

Physical activity influences appetite and leads to improved overall fitness levels. In turn, higher fitness levels mean you gain advantages that benefit your weight control, because of the increased use of body fat as an energy source, without losing lean muscle mass.

One of the major physiological advantages of exercise is that levels of fat in the blood are reduced. We will consider how exercise can influence cholesterol in the blood, and therefore reduce the risk of coronary heart disease (CHD).

ACTIVITY AND APPETITE

Physical activity and food intake are the two key components of energy balance. Effects on intake are influenced by the duration, intensity and frequency of exercise. Appetite is a complex phenomenon and is influenced by several factors. In the brain, within a region called the hypothalamus, is the control center for food intake, the appestat. Many psychological factors influence the desire to eat.

Physiological factors, such as blood sugar levels and hormones, also influence the appestat. It is argued that regular exercise helps the appestat to adjust calorie intake to energy expenditure. For exercise to be of benefit in weight loss then high-fat foods must be avoided. Exercise does not provide us with permission to eat high-fat foods; there is a trade-off between the calorie loss from the physical activity and the calorie intake from the foods consumed.

ENERGY AND BODY COMPOSITION

By 2015, public health experts expect that 75% of all US adults will be either overweight or obese. The desire for a quick solution for weight loss has fostered numerous myths about exercise and diet and has led to the over commercialization of quick weight-loss methods, fad diets, and ineffective exercise programs and devices. It is important for personal trainers to understand what the common myths and inaccuracies about weight loss and diets are, and to be able to educate clients regarding safe and effective diet and weight-loss methods.

Daily Energy Needs

A calorie (lower case c) is a unit of energy and is defi ned as the amount of heat energy required to raise the temperature of 1 gram of water 1 degree Celsius. A Calorie (upper case C) or kilocalorie (kcal) is equal to 1,000 calories. Although not technically correct, calorie, Calorie, and kilocalorie are used interchangeably in nonscientific, everyday language.

Estimating energy requirement

Personal energy requirement = basic energy requirements + extra energy requirements

Basic energy requirements

For every Kg of body weight 1.3 calories of energy is required every hour. (An athlete weighing 50Kg would require 1.3 × 24hrs × 50 kg = 850calories)

Extra energy requirements

For each hour of training you require 8.5 calories of energy for each Kg of body weight. (For a two hour training session our 50Kg athlete would require 8.5 × 2hrs × 50Kg = 850calories)

An athlete weighing 50Kg who trains for two hours would require an intake of approx.2410 calories (1560+850)

Energy Fuel

Like fuel for a car, the energy we need has to be mixed. The mixture that we require is as follows:

- 57% Carbohydrates (sugar, sweets, bread, cakes)
- 30% Fats (dairy Products, oil)
- 13%Protein (eggs, milk, meat, poultry, fish)

The energy yield per gram is as follows: Carbohydrate – 4 calories, Fats – 9 calories and Protein – 4 calories.

What does a 50Kg athlete require in terms of carbohydrates, fats and protein?

Carbohydrates – 57% of 2410 =1374 calories – at 4 calories per gram 1374/4=343 grams

Fats – 30% of 2410 = 723 calories – at 9 calories per gram =723/9-80gram

Protein – 13% of 2410 = 313 calories –at 4 calories per gram = 313/4=78gram

50Kg athlete requires: 343 grams of carbohydrates, 80grams of Fat and 78grams of Protein

Lifestyle changes

A healthy lifestyle is one which helps to keep and improve people's health and well-being. Healthy living is a lifelong effect. The ways to being healthy include healthy eating, physical activities, weight management, and stress management.

Lifestyle changes are a process that take time and require support. Once you're ready to make a change, the difficult part is committing and following through. So do your research and make a plan that will prepare you for success. Careful planning means setting small goals and taking things one step at a time.

There are simple ways to lead a healthy lifestyle and get back on track:

- Get active each day. ...
- Choose water as a drink. ...
- Eat more fruit and vegetables. ...
- Switch off the screen and get active. ...
- Eat fewer snacks and select healthier alternatives.

Gaining weight

Weight gain is an increase in body weight. This can be either an increase in muscle mass, fat deposits or excess fluids such as water. Muscle gain or weight gain can occur as a result of exercise or body building, in which muscle size is increased through strength training. If enough weight us gained by way of increased body fat deposits, one may become overweight or fat, generally defined as having more body fat (adipose tissue) than is optimally healthy.

How to Gain Weight Fast and Safely

About two thirds of people in the US are either overweight or obese. However, there are also many people with the opposite problem of being too skinny. This is a concern, as being underweight can be just as bad for your health as being obese. Additionally, many people who are not clinically underweight still want to gain some muscle. Whether you’re clinically underweight or simply struggling to gain muscle weight, the main principles are the same.

What Does Underweight Really Mean?

Being underweight is defined as having a body mass index (BMI) below 18.5. This is estimated to be less than the body mass needed to sustain optimal health. Conversely, over 25 is considered overweight and over 30 is considered obese. Use this calculation by the body mass index (BMI) or Quetelet index is a value derived from the mass (weight) and height of an individual. The BMI is defined as the body mass divided by the square of the body height, and is universally expressed in units of kg/m2, resulting from mass in kilograms and height in meters.

However, keep in mind that there are many problems with the BMI scale, which only looks at weight and height. It does not take muscle mass into account.

Some people are naturally very skinny but still healthy. Being underweight according to this scale does not necessarily mean that you have a health problem. Being underweight is about 2–3 times more common among girls and women, compared to men. In the US, 1% of men and 2.4% of women 20 years and older are underweight.

Eat More Calories Than Your Body Burns

The most important thing you can do to gain weight is to create a calorie surplus, meaning you eat more calories than your body needs. You can determine your calorie needs using this calorie calculator. If you want to gain weight slowly and steadily, aim for 300–500

calories more than you burn each day according to the calculator. If you want to gain weight fast, aim for around 700–1,000 calories above your maintenance level.

Eat Energy-Dense Foods and Use Sauces, Spices and Condiments

Again, it's very important to eat mostly whole, single-ingredient foods. The problem is that these foods tend to be more filling than processed junk foods, making it harder to get in enough calories. Using plenty of spices, sauces and condiments can help with this. The tastier your food is, the easier it is to eat a lot of it. Also, try to emphasize energy-dense foods as much as possible. These are foods that contain many calories relative to their weight. Here are some energy-dense foods that are perfect for gaining weight:

- Nuts: Almonds, walnuts, macadamia nuts, peanuts, etc.
- Dried fruit: Raisins, dates, prunes and others.
- High-fat dairy: Whole milk, full-fat yogurt, cheese, cream.
- Fats and oils: Extra virgin olive oil and avocado oil.
- Grains: Whole grains like oats and brown rice.
- Meat: Chicken, beef, pork, lamb, etc. Choose fattier cuts.
- Tubers: Potatoes, sweet potatoes and yams.
- Dark chocolate, avocados, peanut butter, coconut milk, granola, trail mixes.

Many of these foods are very filling, and sometimes you may need to force yourself to keep eating even if you feel full. It may be a good idea to avoid eating a ton of vegetables if gaining weight is a priority for you. It simply leaves less room for energy-dense foods. Eating whole fruit is fine, but try to emphasize fruit that doesn't require too much chewing, such as bananas. If you need more suggestions, consider reading this article on 18 healthy foods to gain weight fast.

Lift Heavy Weights and Improve Your Strength

To make sure that the excess calories go to your muscles instead of just your fat cells, it's absolutely crucial to lift weights.

Go to a gym and lift 2–4 times per week. Lift heavy and try to increase the weights and volume over time. If you're completely out of shape or new to training, consider hiring a qualified personal trainer to help you get started. You may also want to consult with a doctor if you have skeletal problems or any medical issue. It's probably best to take it easy on the cardio for now — focus mostly on the weights. Doing some cardio is fine to improve fitness and well-being, but don't do so much that you end up burning all the additional calories you're eating.

DISORDERED EATING

Disordered eating describes a variety of abnormal eating behaviors that, by themselves, do not warrant diagnosis of an eating disorder. Disordered eating includes behaviors that are common features of eating disorders, such as: Chronic restrained eating. Compulsive eating. Binge eating, with associated loss of control.

Eating Disorders are complex disorders, influenced by a facet of factors. Though the exact cause of eating disorders is unknown, it is generally believed that a combination of biological, psychological, and/or environmental abnormalities contribute to the development of these illnesses

Disordered eating refers to a wide range of abnormal eating behaviors, many of which are shared with diagnosed eating disorders. The main thing differentiating disordered eating from an eating disorder is the level of severity and frequency of behaviors.

Disordered eating can have a negative impact on a person's emotional, social and physical wellbeing. It may lead to fatigue, malnutrition or poor concentration. It can affect someone's social life (when socializing is restricted due to anxiety around food/eating), and can lead to anxiety and depression.

Disordered eating behaviors and attitudes include:

- Binge eating
- Dieting, Skipping meals regularly
- Self-induced vomiting
- Obsessive calorie counting
- Self-worth based on body shape and weight
- Misusing laxatives or diuretics
- Fasting or chronic restrained eating (read more on fasting for cultural or religious reasons)

ANOREXIA

Anorexia (an-o-REK-see-uh) nervosa — often simply called anorexia — is an eating disorder characterized by an abnormally low body weight, an intense fear of gaining weight and a distorted perception of weight. People with anorexia place a high value on controlling their weight and shape, using extreme efforts that tend to significantly interfere with their lives. To prevent weight gain or to continue losing weight, people with anorexia usually severely restrict the amount of food they eat. They may control calorie intake by vomiting after eating or by misusing laxatives, diet aids, diuretics or enemas. They may also try to lose weight by exercising excessively. No matter how much weight is lost, the person continues to fear weight gain.

Anorexia isn't really about food. It's an extremely unhealthy and sometimes life-threatening way to try to cope with emotional problems. When you have anorexia, you often equate thinness with self-worth. Anorexia, like other eating disorders, can take over your life and can be very difficult to overcome. But with treatment, you can gain a better sense of who you are, return to healthier eating habits and reverse some of anorexia's serious complications.

Symptoms

The physical signs and symptoms of anorexia nervosa are related to starvation. Anorexia also includes emotional and behavioral issues involving an unrealistic perception of body weight and an extremely strong fear of gaining weight or becoming fat.

It may be difficult to notice signs and symptoms because what is considered a low body weight is different for each person, and some individuals may not appear extremely thin. Also, people with anorexia often disguise their thinness, eating habits or physical problems.

Physical symptoms

Physical signs and symptoms of anorexia may include:

- Extreme weight loss or not making expected developmental weight gains
- Thin appearance
- Abnormal blood counts

- Fatigue
- Insomnia
- Dizziness or fainting
- Bluish discoloration of the fingers
- Hair that thins, breaks or falls out
- Soft, downy hair covering the body
- Absence of menstruation
- Constipation and abdominal pain
- Dry or yellowish skin
- Intolerance of cold
- Irregular heart rhythms
- Low blood pressure
- Dehydration
- Swelling of arms or legs
- Eroded teeth and calluses on the knuckles from induced vomiting

Some people who have anorexia binge and purge, similar to individuals who have bulimia. But people with anorexia generally struggle with an abnormally low body weight, while individuals with bulimia typically are normal to above normal weight.

Emotional and behavioral symptoms

Behavioral symptoms of anorexia may include attempts to lose weight by:

- Severely restricting food intake through dieting or fasting
- Exercising excessively
- Bingeing and self-induced vomiting to get rid of food, which may include the use of laxatives, enemas, diet aids or herbal products
- Emotional and behavioral signs and symptoms may include:
- Preoccupation with food, which sometimes includes cooking elaborate meals for others but not eating them
- Frequently skipping meals or refusing to eat
- Denial of hunger or making excuses for not eating
- Eating only a few certain "safe" foods, usually those low in fat and calories
- Adopting rigid meal or eating rituals, such as spitting food out after chewing
- Not wanting to eat in public
- Lying about how much food has been eaten
- Fear of gaining weight that may include repeated weighing or measuring the body
- Frequent checking in the mirror for perceived flaws
- Complaining about being fat or having parts of the body that are fat
- Covering up in layers of clothing
- Flat mood (lack of emotion)
- Social withdrawal
- Irritability
- Insomnia
- Reduced interest in sex

Unfortunately, many people with anorexia don't want treatment, at least initially. Their desire to remain thin overrides concerns about their health. If you have a loved one you're worried about, urge her or him to talk to a doctor.

If you're experiencing any of the problems listed above, or if you think you may have an eating disorder, get help. If you're hiding your anorexia from loved ones, try to find a person you trust to talk to about what's going on.

Causes

The exact cause of anorexia is unknown. As with many diseases, it's probably a combination of biological, psychological and environmental factors.

Biological: Although it's not yet clear which genes are involved, there may be genetic changes that make some people at higher risk of developing anorexia. Some people may have a genetic tendency toward perfectionism, sensitivity and perseverance — all traits associated with anorexia.

Psychological: Some people with anorexia may have obsessive-compulsive personality traits that make it easier to stick to strict diets and forgo food despite being hungry. They may have an extreme drive for perfectionism, which causes them to think they're never thin enough. And they may have high levels of anxiety and engage in restrictive eating to reduce it.

Environmental: Modern Western culture emphasizes thinness. Success and worth are often equated with being thin. Peer pressure may help fuel the desire to be thin, particularly among young girls.

Risk factors

Anorexia is more common in girls and women. However, boys and men have increasingly developed eating disorders, possibly related to growing social pressures.

Anorexia is also more common among teenagers. Still, people of any age can develop this eating disorder, though it's rare in those over 40. Teens may be more at risk because of all the changes their bodies go through during puberty. They may also face increased peer pressure and be more sensitive to criticism or even casual comments about weight or body shape.

Certain factors increase the risk of anorexia, including

Genetics: Changes in specific genes may put certain people at higher risk of anorexia. Those with a first-degree relative — a parent, sibling or child — who had the disorder have a much higher risk of anorexia.

Dieting and starvation: Dieting is a risk factor for developing an eating disorder. There is strong evidence that many of the symptoms of anorexia are actually symptoms of starvation. Starvation affects the brain and influences mood changes, rigidity in thinking, anxiety and reduction in appetite. Starvation and weight loss may change the way the brain works in vulnerable individuals, which may perpetuate restrictive eating behaviors and make it difficult to return to normal eating habits.

Transitions: Whether it's a new school, home or job; a relationship breakup; or the death or illness of a loved one, change can bring emotional stress and increase the risk of anorexia.

Complications

Anorexia can have numerous complications. At its most severe, it can be fatal. Death may occur suddenly — even when someone is not severely underweight. This may result from abnormal heart rhythms (arrhythmias) or an imbalance of electrolytes — minerals such as sodium, potassium and calcium that maintain the balance of fluids in your body.

Other complications of anorexia include:

- Anemia
- Heart problems, such as mitral valve prolapse, abnormal heart rhythms or heart failure
- Bone loss (osteoporosis), increasing the risk of fractures
- Loss of muscle
- In females, absence of a period
- In males, decreased testosterone
- Gastrointestinal problems, such as constipation, bloating or nausea
- Electrolyte abnormalities, such as low blood potassium, sodium and chloride
- Kidney problems

If a person with anorexia becomes severely malnourished, every organ in the body can be damaged, including the brain, heart and kidneys. This damage may not be fully reversible, even when the anorexia is under control.

In addition to the host of physical complications, people with anorexia also commonly have other mental health disorders as well. They may include:

- Depression, anxiety and other mood disorders
- Personality disorders
- Obsessive-compulsive disorders
- Alcohol and substance misuse
- Self-injury, suicidal thoughts or suicide attempts

Prevention

There's no guaranteed way to prevent anorexia nervosa. Primary care physicians (pediatricians, family physicians and internists) may be in a good position to identify early indicators of anorexia and prevent the development of full-blown illness. For instance, they can ask questions about eating habits and satisfaction with appearance during routine medical appointments.

If you notice that a family member or friend has low self-esteem, severe dieting habits and dissatisfaction with appearance, consider talking to him or her about these issues. Although you may not be able to prevent an eating disorder from developing, you can talk about healthier behavior or treatment options.

BULIMIA NERVOSA

Bulimia Nervosa is a psychological and severe life-threatening eating disorder described by the ingestion of an abnormally large amount of food in short time period, followed by an attempt to avoid gaining weight by purging what was consumed.

Methods of purging include forced vomiting, excessive use of laxatives or diuretics, and extreme or prolonged periods of exercising. Often, in these binge/purge episodes, a woman or man suffering from this disorder will experience a loss of control and engage in frantic efforts to undo these feelings.

Bulimia nervosa is a serious, potentially life-threatening eating disorder characterized by a cycle of bingeing and compensatory behaviors such as self-induced vomiting designed to undo or compensate for the effects of binge eating.

Since he or she may have bingeing and purging episodes in secret, they are often able to conceal their disorder from others for extended periods of time. Those suffering from bulimia nervosa often utilize these behaviors in an attempt to prevent weight gain, to establish a sense of control, and/or as a means of coping with difficult circumstances or situations.

Described and classified by the British psychiatrist Gerald Russell in 1979, Bulimia Nervosa comes from a Greek word meaning ravenous hunger. If you or a loved one are suffering from this eating disorder, seek professional treatment for eating disorders.

Major Types of Bulimia

There are two common types of bulimia nervosa, which are as follows:

Purging type – This type of bulimia nervosa accounts for the majority of cases of those suffering from this eating disorder. In this form, individuals will regularly engage in self-induced vomiting or abuse of laxatives, diuretics, or enemas after a period of bingeing.

Non-Purging type – In this form of bulimia nervosa, the individual will use other inappropriate methods of compensation for binge episodes, such as excessive exercising or fasting. In these cases, the typical forms of purging, such as self-induced vomiting, are not regularly utilized.

Causes of Bulimia

The exact cause of bulimia nervosa is currently unknown; though it is thought that multiple factors contribute to the development of this eating disorder, including genetic, environmental, psychological, and cultural influences. Some of the main causes for bulimia include:

- Stressful transitions or life changes
- History of abuse or trauma
- Negative body image
- Poor self-esteem
- Professions or activities that focus on appearance/performance

Bulimia Signs & Symptoms

An individual suffering from bulimia nervosa may reveal several signs and symptoms, many which are the direct result of self-induced vomiting or other forms of purging, especially if the binge/purge cycle is repeated several times a week and/or day.

Physical signs and symptoms of this eating disorder are:

- Constant weight fluctuations
- Electrolyte imbalances, which can result in cardiac arrhythmia, cardiac arrest, or ultimately death
- Broken blood vessels within the eyes
- Enlarged glands in the neck and under the jaw line
- Oral trauma, such as lacerations in the lining of the mouth or throat from repetitive vomiting
- Chronic dehydration

- Inflammation of the esophagus
- Chronic gastric reflux after eating or peptic ulcers
- Infertility

Signs and symptoms of binge eating and purging are:

- Disappearance of large amounts of food
- Eating in secrecy
- Lack of control when eating
- Switching between periods of overeating and fasting
- Frequent use of the bathroom after meals
- Having the smell of vomit

Bulimia nervosa can also create problematic strains between the sufferer and family and friends, particularly as the individual has abnormal eating behaviors and/or the avoidance of social activities to engage in binge/purge episodes.

Bulimia Treatment

Since negative body image and poor self-esteem are often the underlying factors at the root of bulimia, it is important that therapy is integrated into the recovery process. Treatment for bulimia nervosa usually includes:

Discontinuing the binge-purge cycle: The initial phase of treatment for bulimia nervosa involves breaking this harmful cycle and restoring normal eating behaviors.

Woman struggling with bulimiaImproving negative thoughts: The next phase of bulimia treatment concentrates on recognizing and changing irrational beliefs about weight, body shape, and dieting.

Resolving emotional issues: The final phase of bulimia treatment focuses on healing from emotional issues that may have caused the eating disorder. Treatment may address interpersonal relationships and can include cognitive behavior therapy, dialectic behavior therapy, and other related therapies.

Don’t delay and risk serious medical complications. Seek out an eating disorder treatment facility in your area.

PROPER HYDRATION

Pre-Exercise Hydration

Strategies

- 500-600 ml (17-20 fl oz) of water or a sports drink should be consumed 2-3 hours prior to activity.
- 200-300 ml (7-10 fl oz) of water or a sports drink should be consumed 10-20 minutes prior to activity.
- Individuals should begin all physical activity properly hydrated to help prevent dehydration from occurring.

SPORTS NUTRITION AND HEALTH PROMOTION

Exercise Hydration Strategies

- 200-300 ml (7-10 fl oz) of water should be consumed every 10-20 minutes during activity in order to try to maintain hydration levels.
- Individuals participating in activities with frequent breaks, such as baseball, football, softball, and track & field, should consume small volumes of fluid at regular intervals. Amount of fluid intake and frequency of intake should be based on their rate of sweating and environmental conditions.
- Individuals participating in activities where breaks only occur during time-outs or between quarters, like distance running, field hockey, lacrosse, and soccer, should ingest enough fluids to maximize hydration.

Post-Exercise Hydration Strategies

- The primary goal of rehydrating after activity is to immediately return physiologic function.
- Rehydration fluids should be consumed within 2 hours after activity.
- Rehydration fluids should consist of water, carbohydrates & electrolytes in order to restore hydration status, restore glycogen stores & speed up the rehydration process, respectively.

General Hydration Guidelines

- Fluids with a temperature of 10-15 degrees C (50-59 degrees F) are recommended for rehydration.
- Fluids containing 6-8% of carbohydrates will be beneficial, however, fluids with more than 8% carbohydrates, such as fruit juices, sodas and some sports drinks, should be avoided.
- Additionally, fluids containing fructose, caffeine, and carbonation should also be avoided.

Signs & Symptoms of Dehydration

- Thirst
- Irritability
- General discomfort
- Headache
- Weakness
- Dizziness
- Cramps
- Chills
- Vomiting
- Nausea
- Head or neck heat sensations
- Decreased performance

Treatment of Dehydrated Individuals

- An individual who is dehydrated, conscious, and cognizant can be treated with aggressive oral rehydration.

- Immediate treatment is important to help prevent the occurrence of a heat illness.

If an athlete is not properly hydrated before and during activity or does not properly rehydrate after activity, it can lead to one of the three following types of heat illness:

Heat Cramps

Signs and symptoms include muscle twitching, cramps in arms, legs and abdomen. Treatment of heat cramps should consist of an increase in fluid intake, passive stretching, and rest in a cool place.

Heat Exhaustion

Profuse sweating, excessive thirst, weakness, dizziness, headache, and skin that is gray, ashy, cold and/or clammy are signs and symptoms that may arise. Treatment includes an increase in fluid and salt to the diet and rest in a cool place. In addition, IV fluids may be necessary. Activity should be discontinued until the situation is under control.

Heat Stroke: THIS IS A MEDICAL EMERGENCY

Signs and symptoms include skin that will be hot and dry, irritability, disorientation, glassy eyes, rapid pulse, and a decrease in blood pressure. Treatment should involve decreasing body temperature by ice or ice towels and transportation to an Emergency Room immediately.

Treatment of hyper cholesteremia with exercise, cigarette smoking and exercise, Hypertension and exercise, exercise in the prevention of heart diseases, diabetes mellitus and exercise. Risk factors of coronary heart disease carbohydrate loading, fluid replacement before, during and after exercise for injury prevention ~ electrolytes and its need in athletic performance.

Physical activity

Physical activity is any body movement that works your muscles and requires more energy than resting. Walking, running, dancing, swimming, yoga, and gardening are a few examples of physical activity.

According to the Department of Health and Human Services' 2008 Physical Activity Guidelines for Americans external link physical activity generally refers to movement that enhances health. Exercise is a type of physical activity that's planned and structured. Lifting weights, taking an aerobics class, and playing on a sports team are examples of exercise. Physical activity is one part of a heart-healthy lifestyle.

A heart-healthy lifestyle also involves following a heart-healthy eating, aiming for a healthy weight, managing stress, and quitting smoking. Many Americans are not active enough. The good news, though, is that even modest amounts of physical activity are good for your health. The more active you are, the more you will benefit.

Benefits of Physical Activity

Physical activity has many health benefits. These benefits apply to people of all ages and races and both sexes. For example, physical activity helps you maintain a healthy weight and makes it easier to do daily tasks, such as climbing stairs and shopping. Physically active adults are at lower risk for depression and declines in cognitive function as they get older. (Cognitive function includes thinking, learning, and judgment skills.) Physically active children and teens may have fewer symptoms of depression than their peers.

Physical activity also lowers your risk for many diseases, such as coronary heart disease (CHD), diabetes, and cancer.

Cholesterol is a waxy substance found in your blood. Your body needs cholesterol to build healthy cells, but high levels of cholesterol can increase your risk of heart disease.

With high cholesterol, you can develop fatty deposits in your blood vessels. Eventually, these deposits grow, making it difficult for enough blood to flow through your arteries. Sometimes, those deposits can break suddenly and form a clot that causes a heart attack or stroke.

High cholesterol can be inherited, but it's often the result of unhealthy lifestyle choices, which make it preventable and treatable. A healthy diet, regular exercise and sometimes medication can help reduce high cholesterol.

Causes

Cholesterol is carried through your blood, attached to proteins. This combination of proteins and cholesterol is called a lipoprotein. There are different types of cholesterol, based on what the lipoprotein carries. They are:

Low-density lipoprotein (LDL). LDL, the "bad" cholesterol, transports cholesterol particles throughout your body. LDL cholesterol builds up in the walls of your arteries, making them hard and narrow.

High-density lipoprotein (HDL). HDL, the "good" cholesterol, picks up excess cholesterol and takes it back to your liver.

A lipid profile also typically measures triglycerides, a type of fat in the blood. Having a high triglyceride level also can increase your risk of heart disease.

Factors you can control — such as inactivity, obesity and an unhealthy diet — contribute to harmful cholesterol and triglyceride levels. Factors beyond your control might play a role, too. For example, your genetic makeup might make it more difficult for your body to remove LDL cholesterol from your blood or break it down in the liver.

Medical conditions that can cause unhealthy cholesterol levels include:

Chronic kidney disease
Diabetes
HIV/AIDS
Hypothyroidism
Lupus

Cholesterol levels can also be worsened by some types of medications you may be taking for other health problems, such as:

Acne
Cancer
High blood pressure
HIV/AIDS
Irregular heart rhythms
Organ transplants
Risk factors

Factors that can increase your risk of unhealthy cholesterol levels include:

Poor diet. Eating too much saturated fat or trans fats can result in unhealthy cholesterol levels. Saturated fats are found in fatty cuts of meat and full-fat dairy products. Trans fats are often found in packaged snacks or desserts.

- Obesity. Having a body mass index (BMI) of 30 or greater puts you at risk of high cholesterol.
- Lack of exercise. Exercise helps boost your body's HDL, the "good," cholesterol.
- Smoking. Cigarette smoking may lower your level of HDL, the "good," cholesterol.
- Alcohol. Drinking too much alcohol can increase your total cholesterol level.
- Age.

Even young children can have unhealthy cholesterol, but it's much more common in people over 40. As you age, your liver becomes less able to remove LDL cholesterol.

Complications
Development of atherosclerosis
Development of atherosclerosis
Enlarge image

High cholesterol can cause a dangerous accumulation of cholesterol and other deposits on the walls of your arteries (atherosclerosis). These deposits (plaques) can reduce blood flow through your arteries, which can cause complications, such as:

Chest pain. If the arteries that supply your heart with blood (coronary arteries) are affected, you might have chest pain (angina) and other symptoms of coronary artery disease.

Heart attack. If plaques tear or rupture, a blood clot can form at the plaque-rupture site — blocking the flow of blood or breaking free and plugging an artery downstream. If blood flow to part of your heart stops, you'll have a heart attack.

Stroke. Similar to a heart attack, a stroke occurs when a blood clot blocks blood flow to part of your brain.

Prevention

The same heart-healthy lifestyle changes that can lower your cholesterol can help prevent you from having high cholesterol in the first place. To help prevent high cholesterol, you can:

- Eat a low-salt diet that emphasizes fruits, vegetables and whole grains
- Limit the amount of animal fats and use good fats in moderation
- Lose extra pounds and maintain a healthy weight
- Quit smoking
- Exercise on most days of the week for at least 30 minutes
- Drink alcohol in moderation, if at all
- Manage stress

Physical Activity Strengthens the Heart and Improves Lung Function

When done regularly, moderate- and vigorous-intensity physical activity strengthens your heart muscle. This improves your heart's ability to pump blood to your lungs and throughout your body. As a result, more blood flows to your muscles, and oxygen levels in your blood rise. Capillaries, your body's tiny blood vessels, also widen. This allows them to deliver more oxygen to your body and carry away waste products.

Physical Activity Reduces Coronary Heart Disease Risk Factors

When done regularly, moderate- and vigorous-intensity aerobic activity can lower your risk for CHD. CHD is a condition in which a waxy substance called plaque (plak) builds up inside your coronary arteries. These arteries supply your heart muscle with oxygen-rich blood. Plaque narrows the arteries and reduces blood flow to your heart muscle. Eventually, an area of plaque can rupture (break open). This causes a blood clot to form on the surface of the plaque. If the clot becomes large enough, it can mostly or completely block blood flow through a coronary artery. Blocked blood flow to the heart muscle causes a heart attack. Certain traits, conditions, or habits may raise your risk for CHD. Physical activity can help control some of these risk factors because it:

- Can lower blood pressure and triglyceride. Triglycerides are a type of fat in the blood.

- Can raise HDL cholesterol levels. HDL sometimes is called “good” cholesterol.
- Helps your body manage blood sugar and insulin levels, which lowers your risk for type 2 diabetes.
- Reduces levels of C-reactive protein (CRP) in your body. This protein is a sign of inflammation. High levels of CRP may suggest an increased risk for CHD.
- Helps reduce overweight and obesity when combined with a reduced-calorie diet. Physical activity also helps you maintain a healthy weight over time once you have lost weight.
- May help you quit smoking. Smoking is a major risk factor for CHD.

Inactive people are more likely to develop CHD than people who are physically active. Studies suggest that inactivity is a major risk factor for CHD, just like high blood pressure, high blood cholesterol, and smoking.

Physical Activity Reduces Heart Attack Risk

For people who have CHD, aerobic activity done regularly helps the heart work better. It also may reduce the risk of a second heart attack in people who already have had heart attacks. Vigorous aerobic activity may not be safe for people who have CHD. Ask your doctor what types of activity are safe for you.

Heart Disease

Heart disease describes a range of conditions that affect your heart. Diseases under the heart disease umbrella include blood vessel diseases, such as coronary artery disease; heart rhythm problems (arrhythmias); and heart defects you're born with (congenital heart defects), among others.

DEFINITION

The term "heart disease" is often used interchangeably with the term "cardiovascular disease." Cardiovascular disease generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack, chest pain (angina) or stroke. Other heart conditions, such as those that affect your heart's muscle, valves or rhythm, also are considered forms of heart disease.

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The warning signals for heart disease

- Chest Discomfort. It's the most common sign of heart danger
- Nausea, Indigestion, Heartburn, or Stomach Pain.
- Pain that Spreads to the Arm.
- You Feel Dizzy or Lightheaded.
- Throat or Jaw Pain.
- You Get Exhausted Easily.
- Snoring.
- Sweating.

Heart disease symptoms depend on what type of heart disease you have.

The symptoms of heart disease (atherosclerotic disease)

Cardiovascular disease symptoms may be different for men and women. For instance, men are more likely to have chest pain; women are more likely to have other symptoms along with chest discomfort, such as shortness of breath, nausea and extreme fatigue.

Symptoms can include:

- Chest pain, chest tightness, chest pressure and chest discomfort (angina)
- Shortness of breath
- Pain, numbness, weakness or coldness in your legs or arms if the blood vessels in those parts of your body are narrowed
- Pain in the neck, jaw, throat, upper abdomen or back

You might not be diagnosed with cardiovascular disease until you have a heart attack, angina, stroke or heart failure. It's important to watch for cardiovascular symptoms and discuss concerns with your doctor. Cardiovascular disease can sometimes be found early with regular evaluations.

Heart disease symptoms caused by abnormal heartbeats (heart arrhythmias)

A heart arrhythmia is an abnormal heartbeat. Your heart may beat too quickly, too slowly or irregularly. Heart arrhythmia symptoms can include:

- Fluttering in your chest
- Racing heartbeat (tachycardia)
- Slow heartbeat (bradycardia)
- Chest pain or discomfort

- Shortness of breath
- Lightheadedness
- Dizziness
- Fainting or near fainting

Heart disease symptoms caused by heart defects

Serious congenital heart defects — defects you're born with — usually become evident soon after birth. Heart defect symptoms in children could include:

- Pale gray or blue skin colour
- Swelling in the legs, abdomen or areas around the eyes
- In an infant, shortness of breath during feedings, leading to poor weight gain

Less serious congenital heart defects are often not diagnosed until later in childhood or during adulthood. Signs and symptoms of congenital heart defects that usually aren't immediately life-threatening include:

- Easily getting short of breath during exercise or activity
- Easily tiring during exercise or activity
- Swelling in the hands, ankles or feet

Heart disease symptoms caused by weak heart muscle (dilated cardiomyopathy)

In early stages of cardiomyopathy, you may have no symptoms. As the condition worsens, symptoms may include:

- Breathlessness with exertion or at rest
- Swelling of the legs, ankles and feet
- Fatigue
- Irregular heartbeats that feel rapid, pounding or fluttering
- Dizziness, lightheadedness and fainting

Heart disease symptoms caused by heart infections

Endocarditis is an infection that affects the inner membrane that separates the chambers and valves of the heart (endocardium). Heart infection symptoms can include:

- Fever
- Shortness of breath
- Weakness or fatigue
- Swelling in your legs or abdomen
- Changes in your heart rhythm
- Dry or persistent cough
- Skin rashes or unusual spots

Heart disease symptoms caused by valvular heart disease

The heart has four valves — the aortic, mitral, pulmonary and tricuspid valves — that open and close to direct blood flow through your heart. Valves may be damaged by a variety of conditions leading to narrowing (stenosis), leaking (regurgitation or insufficiency) or improper closing (prolapse).

Depending on which valve isn't working properly, valvular heart disease symptoms generally include:

- Fatigue
- Shortness of breath
- Irregular heartbeat
- Swollen feet or ankles
- Chest pain
- Fainting (syncope)

When to see a doctor?

Seek emergency medical care if you have these heart disease symptoms:

- Chest pain
- Shortness of breath
- Fainting

Heart disease is easier to treat when detected early, so talk to your doctor about your concerns regarding your heart health. If you're concerned about developing heart disease, talk to your doctor about steps you can take to reduce your heart disease risk. This is especially important if you have a family history of heart disease.

RISK FACTORS THAT ARE NON-MODIFIABLE

Let's start with the bad news first: There's nothing you can do about three of the biggest risk factors for heart disease. Your age, family history, and even your gender are all strong risk factors for cardiovascular disease. That's the bad news. The good news is that knowing how these risk factors affect you can help you and your doctor reduce their impact. In fact, it might even be more important to address existing conditions like high cholesterol and blood pressure as you age and if you have a strong family history of heart disease. Good heart health starts with awareness.

Here are the three most important non-modifiable risk factors for heart disease:

1. **Age:** The older you get, the more likely you are to suffer from heart disease. Medical professionals always factor age into risk calculators to estimate your risk of heart disease. And while "age is just a number," it's still important to take into account when making treatment decisions.
2. **Family history/genetics**: Sorry, if a family member who have developed heart disease at a young age (before 55 for men and 65 for women) they are at greater risk. While it can't change the genes, you can change your environment, which is partially responsible for how your genes are expressed .
3. **Gender:** Men have a higher risk of heart disease than women until the age of 75. It's just one of those things. Studies previously thought that women's lower risk of heart disease was due to the protective effects of estrogen on the cardiovascular system. However, more research has shown that may not be true after all, and even though the reasons for this gender gap aren't totally clear, the results remain the same.

RISK FACTORS THAT CAN BE MODIFIABLE

One can modify the rest of the heart disease risk factors on this list with a few simple lifestyle changes.

1. **Smoking:** The CDC estimates that smoking can double or even quadruple your risk of heart disease and stroke. Smoking damages blood vessels and increases blood pressure and plaque build-up in the arteries. These factors increase the likelihood of developing arterial blood clots (aka heart attacks and strokes).
2. **Sedentary lifestyle**: A sedentary lifestyle increases the risk of cardiovascular disease in men. Increasing your physical activity has been shown to protect against cardiovascular disease in a dose-response relationship—meaning that a larger dose of exercise is more protective than a smaller one. When it comes to being physically active, more is more.
3. **Poor Diet:** Nutrition science is confusing. Every day you hear about another super food or life-changing diet that will revolutionize your health. Most of this advice is hype. However, there are a few dietary patterns that have been shown to be beneficial for health, including cardiovascular health. The Mediterranean Diet is one such diet. It's relatively high in fat from olive oil and nuts and suggests eating more fruits, vegetables, fish, fermented dairy products, and poultry. It's also low in sweets, refined carbohydrates, sugar-sweetened beverages, added sugar, and red meat.
4. **Obesity**: Obesity is an independent risk factor for heart disease. Basically, that means, all things being equal, obesity alone increases your risk for heart disease. If that's not bad enough, type 2 diabetes, high cholesterol, hypertension, inflammation, blood clots and dysfunctional blood vessel linings (endothelial dysfunction) are all connected to both obesity and heart disease. There's also some research that shows that weight loss intervention can prolong life in adults with obesity.

Coronary Heart Disease

The heart is a muscle, about the same size as an adult human fist. Blood is pumped from the heart to the lungs, where it collects oxygen. This oxygen-rich blood is then pumped back to the heart and then to organs throughout the body through arteries. The blood then returns to the heart through the veins and is pumped to the lungs again. This is called circulation.

Coronary arteries are the heart's network of blood vessels. They exist on the surface of the heart, and they supply the heart muscle with oxygen. If the coronary arteries narrow, the supply of oxygen-rich blood to the heart may become too low, especially during physical activity.

At first, this reduction in blood flow may not produce any symptoms, but as fatty deposits, or plaques, build up in the coronary arteries, signs and symptoms may emerge.

Symptoms of Coronary Artery Disease

The most common symptom of coronary artery disease is angina, or chest pain. Angina can be described as a discomfort, heaviness, pressure, aching, burning, fullness, squeezing, or painful feeling in your chest. It can be mistaken for indigestion or heartburn. Angina may also be felt in the shoulders, arms, neck, throat, jaw, or back.

Other symptoms of coronary artery disease include:

- Shortness of breath
- Palpitations (irregular heartbeats, or a "flip-flop" feeling in your chest)
- A faster heartbeat
- Weakness or dizziness
- Nausea
- Sweating

STROKE

Definition

A stroke occurs when the supply of blood to the brain is either interrupted or reduced. When this happens, the brain does not get enough oxygen or nutrients, and brain cells start to die

There are two types of stroke.

1. Ischemic stroke is similar to a heart attack, except it occurs in the blood vessels of the brain. Clots can form in the brain's blood vessels, in blood vessels leading to the brain, or even in blood vessels elsewhere in the body and then travel to the brain. These clots block blood flow to the brain's cells. Ischemic stroke can also occur when too much plaque (fatty deposits and cholesterol) clogs the brain's blood vessels. About 80% of all strokes are ischemic.
2. Hemorrhagic (heh-more-raj-ik) strokes occur when a blood vessel in the brain breaks or ruptures. The result is blood seeping into the brain tissue, causing damage to brain cells. The most common causes of hemorrhagic stroke are high blood pressure and brain aneurysms. An aneurysm is a weakness or thinness in the blood vessel wall.

Warning Signs of Stroke

1. Sudden numbness or weakness in the face, arm or leg (especially on one side of the body).
2. Sudden confusion or trouble speaking or understanding speech.
3. Sudden vision problems in one or both eyes.
4. Sudden difficulty walking or dizziness, loss of balance or problems with coordination.
5. Severe headache with no known cause.

Symptoms of stroke in women

Women can have unique symptoms. These symptoms can also happen suddenly, and include:

- Fainting
- General weakness
- shortness of breath
- Confusion or unresponsiveness
- Sudden behavioral change

- Irritation
- Hallucination
- Nausea or vomiting
- Pain
- Hiccups

Controllable Risk Factors

- Hypertension, or high blood pressure, is the single most important risk factor for stroke. A blood pressure of 140/90 or above in adults is considered to be high. The usual target for blood pressure treatment in adults is to keep the blood pressure at 120/80 or below.
- Smoking remains the most important preventable cause of premature death in the country. If you smoke, quit, and if you don't smoke, don't start. Look for smoking cessation resources in your community.
- Heart disease, especially atrial fibrillation (a type of irregular heartbeat), is a significant risk factor for stroke. If you have heart disease, carefully follow your treatment plan.
- Diabetes mellitus increases stroke risk, especially for strokes due to damage of small blood vessels. The usual target for control is an HbA1c of <7% or a fasting blood sugar of 80-120 mg/dL.
- High cholesterol (also called hyperlipidemia) increases the risk of stroke. Have your cholesterol level checked and control your cholesterol level, if necessary, by limiting the amount of fat and cholesterol you eat. The target level of low-density lipoproteins (LDL), the "bad" cholesterol, is less than 70 mg/dL.
- **Alcohol** (more than one drink per day) is associated with stroke risk. Limit the amount of alcohol you drink. Being overweight or obese and leading a sedentary lifestyle may increase your risk of developing hypertension and diabetes, two risk factors for stroke.
- **Existing carotid and/or coronary artery disease**. The carotid arteries in neck supply most of the blood to the brain. A carotid artery that has been damaged by fatty build-up of plaque inside the artery wall may become blocked by a blood clot, causing a stroke.
- **Illegal drug use.** Street drugs, such as crack, cocaine, and marijuana have been shown to increase the risk of stroke. Some of these drugs directly affect the blood vessels in the brain causing a stroke. Others cause damage to the heart, which can lead to stroke.

Uncontrollable Risk Factors

- **Age:** People of all ages, including children, have strokes. However, the risk of stroke increases as age increases.
- **Gender:** Stroke is more common in men than in women. In most age groups, more men than women will have a stroke in a given year. However, women account for more than half of all stroke deaths. Women who are pregnant have a higher stroke risk. Also, at higher risk are women who take birth control pills and who also smoke or have risk factors such as high blood pressure.
- **Family history:** Your stroke risk is greater if a parent, grandparent, sister, or brother has had a stroke.

- **Prior stroke or heart attack:** A person who has already had a stroke or heart attack is at much higher risk of having a second stroke.

Atherosclerosis

- Arteriosclerosis occurs when the blood vessels that carry oxygen and nutrients from your heart to the rest of your body (arteries) become thick and stiff, sometimes restricting blood flow to your organs and tissues. Healthy arteries are flexible and elastic, but over time, the walls in the arteries can harden, a condition commonly called hardening of the arteries.
- Atherosclerosis is the narrowing of arteries due to plaque build-up on the artery walls. Arteries carry blood from the heart to the rest of the body. They are lined with a thin layer of cells that keeps them smooth and allows blood to flow easily. This is called the endothelium.

SYMPTOMS OF ATHEROSCLEROSIS

Symptoms of moderate to severe atherosclerosis depend on which arteries are affected. For example:

- If you have atherosclerosis in your heart arteries, you may have symptoms, such as chest pain or pressure (angina).
- If you have atherosclerosis in the arteries leading to your brain, you may have signs and symptoms such as sudden numbness or weakness in your arms or legs, difficulty speaking or slurred speech, temporary loss of vision in one eye, or drooping muscles in your face. These signal a transient ischemic attack (TIA), which, if left untreated, may progress to a stroke.
- If you have atherosclerosis in the arteries in your arms and legs, you may have symptoms of peripheral artery disease, such as leg pain when walking (claudication).
- If you have atherosclerosis in the arteries leading to your kidneys, you develop high blood pressure or kidney failure.

Risk Factors That Can Be Controlled

- High blood pressure
- High cholesterol
- Diabetes
- Obesity
- Smoking and other tobacco use
- Lack of exercise
- An unhealthy diet

Risk factor which cannot be Controlled

- **Unhealthy blood cholesterol levels** - this includes high LDL cholesterol (sometimes called bad cholesterol) and low HDL cholesterol (sometimes called good cholesterol).

- **High blood pressure** - blood pressure is considered high if it stays at or above 140/90 mmHg over a period of time

- **Smoking** - this can damage and tighten blood vessels, raise cholesterol levels, and raise blood pressure - smoking also doesn't allow enough oxygen to reach the body's tissues.

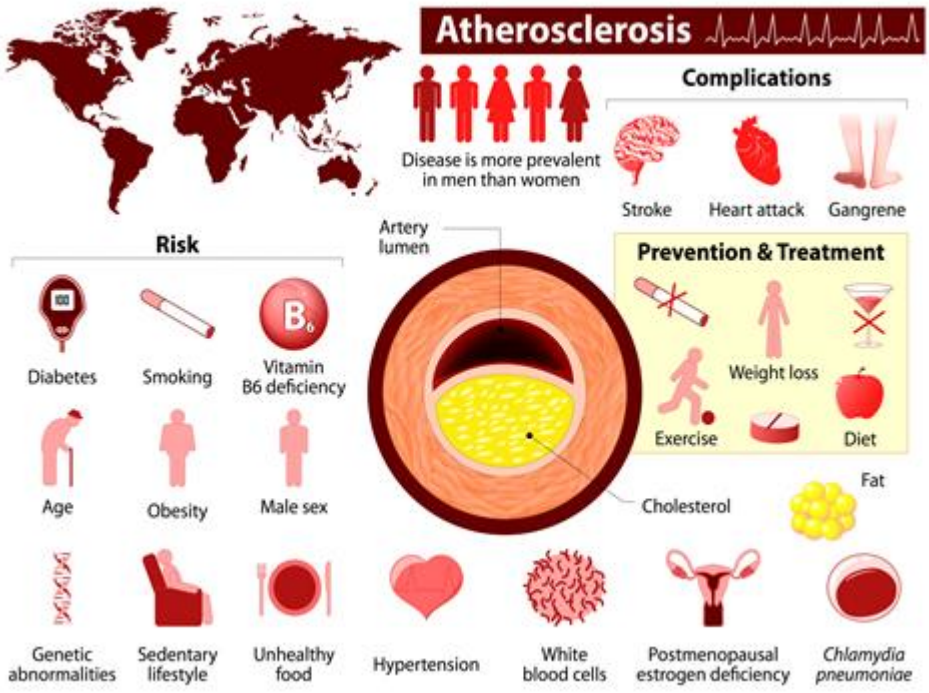
- **Insulin resistance** - Insulin is a hormone that helps move blood sugar into cells where it's used and insulin resistance occurs when the body cannot use its own insulin properly.

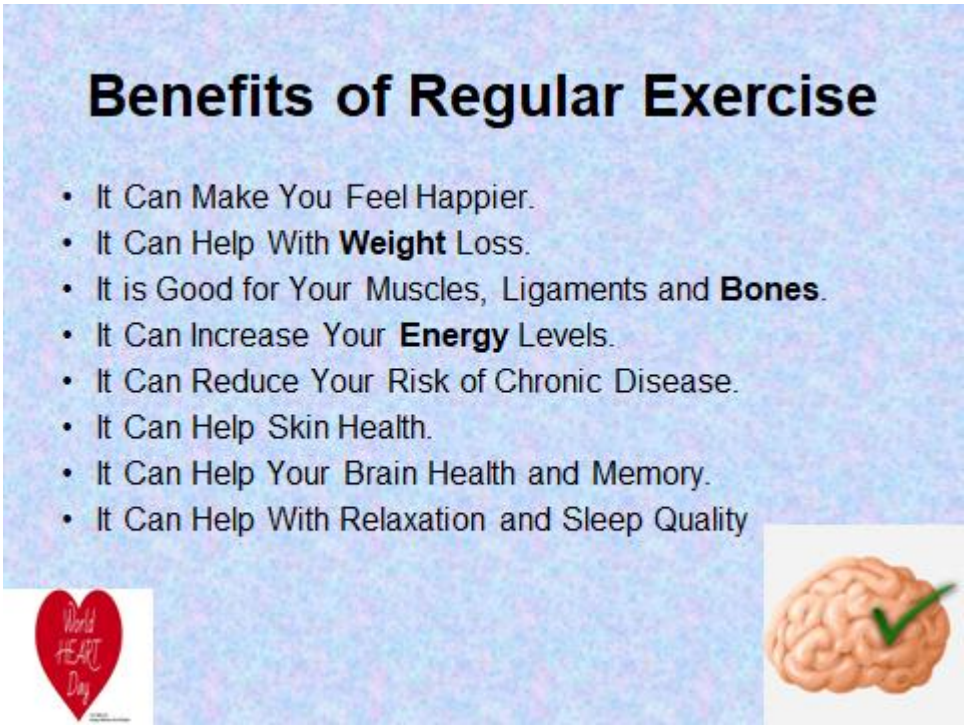
- **Diabetes** - this is a disease in which the body's blood sugar level is high because the body doesn't make enough insulin or does not use its insulin properly.

- **Overweight or obesity** - overweight is having extra body weight from muscle, bone, fat, and/or water - obesity is having a high amount of extra body fat.

- **Lack of physical activity** - lack of activity can worsen other risk factors for atherosclerosis.

- **Age** - as the body ages the risk for atherosclerosis increases and genetic or lifestyle factors cause plaque to gradually build in the arteries - by middle-age or older, enough plaque has built up to cause signs or symptoms, in men, the risk increases after age 45, while in women, the risk increases after age 55





Atherosclerosis Vs Exercise

Exercise helps prevent atherosclerosis in a number of ways. It keeps arteries healthy by lowering bad cholesterol and boosting good cholesterol. And it reduces other risk factors for atherosclerosis and blood clots, such as high blood pressure, diabetes, obesity, and stress.

Regular exercise also helps arteries by boosting the production of nitric oxide by the cells lining the arteries, which helps circulation. And new research in mice suggests that exercise stimulates the bone marrow to produce new cells for the arterial lining, which replace aging cells and repair damaged arteries. Even in healthy people who are free of atherosclerosis, age takes its toll on arteries. As you age, arteries become stiffer, stickier, and narrower. But scientists in Italy found that in people who exercised regularly, age had a much smaller effect on arteries.

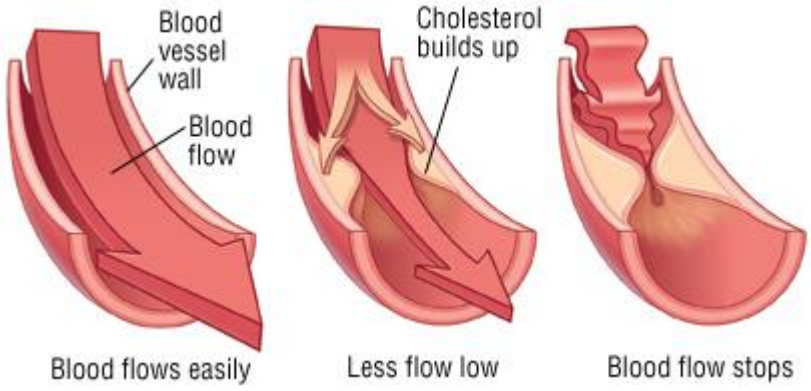
HIGH CHOLESTEROL (HYPERCHOLESTEROLEMIA)

Cholesterol is a fatty substance that occurs naturally in the body. It performs several vital functions. It is needed to make the walls surrounding the body's cells and is the basic material that is converted to certain hormones. Your body makes all the cholesterol you need. You need only a small amount of fat in your diet to make enough cholesterol to stay healthy.

The fat and cholesterol you eat are absorbed in the intestine and transported to the liver. The liver converts fat into cholesterol, and releases cholesterol into the bloodstream. There are two main types of cholesterol: low-density lipoprotein (LDL) cholesterol (the "bad" cholesterol) and high-density lipoprotein (HDL) cholesterol (the "good" cholesterol).

High levels of LDL cholesterol are linked to atherosclerosis, which is the accumulation of cholesterol-rich fatty deposits in arteries. This can cause arteries to narrow or become blocked,

slowing or stopping the flow of blood to vital organs, especially the heart and brain. Atherosclerosis affecting the heart is called coronary artery disease, and it can cause a heart attack. When atherosclerosis blocks arteries that supply blood to the brain, it can cause a stroke.



High levels of HDL cholesterol actually protect against heart attacks and strokes by removing cholesterol from the arteries and bringing it back to the liver.

Because high cholesterol levels can cause atherosclerosis, doctors recommend that people keep their cholesterol levels within a specific range. In general, adults older than 20 should try to keep their total cholesterol level below 200 milligrams per deciliter.

For a more precise assessment of the risk of atherosclerosis, your LDL cholesterol should be checked. According to guidelines established by the government-sponsored National Cholesterol Education Program, the desirable level for LDL cholesterol depends on whether or not a person already has a disease caused by atherosclerosis or diabetes or other risk factors for coronary artery disease. In addition to a high LDL cholesterol level and diabetes, risk factors for coronary artery disease include:

- Being a male older than 45
- Being a female older than 55
- Being a female with premature menopause
- Having a family history of premature coronary artery disease (a father or brother younger than 55 with coronary artery disease or a mother or sister younger than 65 with coronary artery disease)
- Smoking cigarettes
- Having high blood pressure
- Not having enough good cholesterol (high density lipoprotein or HDL)

If you have coronary artery disease, peripheral arterial disease or have had a stroke from atherosclerosis, your LDL cholesterol should be 70 milligrams per deciliter or less.

The more risk factors you have, the lower your target LDL cholesterol should be. In general, an LDL cholesterol level of less than 100 is best, but less than 130 may be acceptable for people with few or no risk factors.

Your level of HDL cholesterol is also very important. People with levels below 40 milligrams per deciliter are more likely to develop atherosclerosis, heart disease and stroke.

Levels of HDL cholesterol above 60 milligrams per deciliter are associated with less atherosclerosis and are thought to help protect against heart disease and stroke.

Symptoms

Most people with high cholesterol don't have any symptoms until cholesterol-related atherosclerosis causes significant narrowing of the arteries leading to their hearts or brains. The result can be heart-related chest pain (angina) or other symptoms of coronary artery disease, as well as symptoms of decreased blood supply to the brain (transient ischemic attacks or stroke). About 1 out of every 500 people has an inherited disorder called familial hypercholesterolemia, which can cause extremely high cholesterol levels (above 300 milligrams per deciliter). People with this disorder can develop nodules filled with cholesterol (xanthomas) over various tendons, especially the Achilles tendons of the lower leg. Cholesterol deposits also can occur on the eyelids, where they are called xanthelasmas.

Diagnosis

Your doctor will ask if anyone in your family has had coronary artery disease, high cholesterol or diabetes. The doctor will ask about your diet and if you have ever smoked. He or she will check your blood pressure and look for xanthomas and xanthelasmas. Your doctor can confirm a diagnosis of high cholesterol with a simple blood test.

Expected Duration

If your cholesterol level is high, you will need to make a long-term effort to bring it down. You can significantly lower your cholesterol levels by sticking with a diet that is low in saturated fats, high in fruits and vegetables, and by substituting "good" fats for "bad" fats. The dietary changes need to be permanent to maintain lower cholesterol levels. Daily exercise also is important. Exercise can raise HDL (good) cholesterol and lower total cholesterol.

Prevention

You may help to prevent high cholesterol by staying on a healthy diet and exercising daily. Avoid high-fat foods (eggs, fatty red meats, palm or coconut oil, dairy products made with whole milk). Instead eat more fresh fruits and vegetables, whole-grain breads and cereals, and low-fat dairy products.

Treatment

The initial treatment of high cholesterol should always be lifestyle changes. This means altering your diet and getting more exercise. Some people respond dramatically to dietary changes.

Diet

There is no consensus on the best diet. The most effective diet to lower total and LDL cholesterol is a vegetarian diet. However, this is not an easy diet to follow.

Many people prefer a "Mediterranean style" diet. There is no strict definition for what should be included in this type of diet. In general, this means

- Getting the majority of daily food calories from plant sources, especially fruits and vegetables, grains, beans, nuts, and seeds
- Using olive oil as the principal fat, replacing other fats and oils
- Having some low fat cheese and/or yogurt daily
- Eating fish a couple times per week
- Limiting processed foods
- Drinking alcohol in moderation unless medically not indicated. No more than two drinks per day for men and one per day for women.

The National Cholesterol Education Program recommends the following diet:

- `Saturated fat—less than 7% of calories
- Monounsaturated fat—about 20% of calories
- Polyunsaturated fat—about 10% of calories
- Protein—about 15% of calories
- Carbohydrates—about 50% of calories
- Fiber— about 25 grams of soluble fiber per day
- Cholesterol—less than 200 milligrams per day

Avoid all trans fats.

- To maintain a desirable weight, you should take in only as many calories as you burn each day. If you need to lose weight, you need to take in fewer calories than you burn.
- People who aren't sure how to follow such a diet may find it useful to work with a health care professional such as a dietitian, nutritionist, doctor or nurse.
- In addition to dietary changes, you should get at least 30 minutes of moderate-intensity exercise, such as brisk walking, daily.

Becoming more physically active

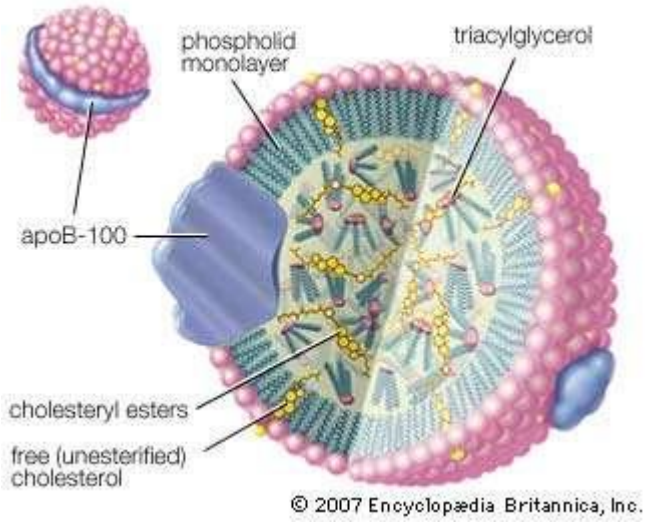
A sedentary lifestyle lowers HDL (good) cholesterol. Less HDL means there’s less good cholesterol to remove LDL (bad) cholesterol from your arteries.

Physical activity is important. Just 40 minutes of aerobic exercise (of moderate to vigorous intensity) three to four times a week is enough to lower both cholesterol and high blood pressure. And there are lots of options: brisk walking, swimming, bicycling or even a dance class can fit the bill.

Lipoproteins

Lipoproteins are lipid-protein complexes that allow all lipids derived from food or synthesized in specific organs to be transported throughout the body by the circulatory system. The basic structure of these aggregates is that of an oil droplet made up of triglycerides and cholesteryl esters surrounded by a layer of proteins and amphipathic lipids—very similar to that

of a micelle, a spherical structure described in the section Fatty acids. If the concentration of one or another lipoprotein becomes too high, then a fraction of the complex becomes insoluble and is deposited on the walls of arteries and capillaries. This buildup of deposits is called atherosclerosis and ultimately results in blockage of critical arteries to cause a heart attack or stroke. Because of the gravity of this condition, much research is focused on lipoproteins and their functions. The emphasis in the following discussion is therefore placed on human lipoproteins.



Cutaway view of a low-density lipoprotein (LDL) complex The LDL complex is essentially a droplet of triacylglycerols and cholesteryl esters encased in a sphere made up of phospholipid, free cholesterol, and protein molecules known as a poprotein B-100 (ApoB-100). The LDL complex is the principal vehicle for delivering cholesterol to body tissues through the blood.

Classification and formation of lipoproteins

There are four major classes of circulating lipoproteins, each with its own characteristic protein and lipid composition. They are chylomicrons, very low-density lipoproteins (VLDL), low-density lipoproteins (LDL), and high-density lipoproteins (HDL). Within all these classes of complexes, the various molecular components are not chemically linked to each other but are simply associated in such a way as to minimize hydrophobic contacts with water.

Very low-density lipoproteins (VLDL)

VLDL is a lipoprotein class synthesized by the liver that is analogous to the chylomicrons secreted by the intestine. Its purpose is also to deliver triglycerides, cholesteryl esters, and cholesterol to peripheral tissues. VLDL is largely depleted of its triglyceride content in these tissues and gives rise to an intermediate-density lipoprotein (IDL) remnant, which is returned to the liver in the bloodstream. As might be expected (*see*table), the same proteins are present in both VLDL and IDL.

Low-density lipoproteins (LDL)

Low-density lipoproteins are derived from VLDL and IDL in the plasma and contain a large amount of cholesterol and cholesteryl esters. Their principal role is to deliver these two forms of cholesterol to peripheral tissues. Almost two-thirds of the cholesterol and its esters found in plasma (blood free of red and white cells) is associated with LDL.

High-density lipoproteins (HDL)

Lipoproteins of this class are the smallest, with a diameter of 10.8 nm and the highest protein-to-lipid ratio. The resulting high density gives this class its name. HDL plays a primary role in the removal of excess cholesterol from cells and returning it to the liver, where it is metabolized to bile acids and salts that are eventually eliminated through the intestine. LDL and HDL together are the major factors in maintaining the cholesterol balance of the body. Because of the high correlation between blood cholesterol levels and atherosclerosis, high ratios of HDL to cholesterol (principally as found in LDL) correlate well with a lower incidence of this disease in humans.

Lifestyle Factors Vs Exercise

One of the biggest contributors to these statistics is a lack of commitment to a heart healthy lifestyle. Your lifestyle is not only your best defence against heart disease and stroke, it's also your responsibility. A heart-healthy lifestyle includes the ideas listed below. By following these simple steps you can reduce all of the modifiable risk factors for heart disease, heart attack and stroke.

Lifestyle Changes

Stop smoking

If you smoke, quit. If someone in your household smokes, encourage them to quit. We know it's tough. But it's tougher to recover from a heart attack or stroke or to live with chronic heart disease. Commit to quit. We're here to help if you need it.

Choose good nutrition

A healthy diet is one of the best weapons you have to fight cardiovascular disease. The food you eat (and the amount) can affect other controllable risk factors: cholesterol, blood pressure, diabetes and overweight. Choose nutrient-rich foods — which have vitamins, minerals, fiber and other nutrients but are lower in calories — over nutrient-poor foods. Choose a diet that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, nontropical vegetable oils, and nuts; and limits intake of sweets, sugar-sweetened beverages, and red meats. And to maintain a healthy weight, coordinate your diet with your physical activity level so you're using up as many calories as you take in.

HIGH BLOOD CHOLESTEROL

Fat lodged in your arteries is a disaster waiting to happen. Sooner or later it could trigger a heart attack or stroke. You've got to reduce your intake of saturated fat, trans fat and cholesterol and get moving. If diet and physical activity alone don't get those numbers down, then medication may be the key. Take it just like the doctor orders. Here's the lowdown on where those numbers need to be:

- **Total Cholesterol**

  Your total cholesterol score is calculated using the following equation: HDL + LDL + 20 percent of your triglyceride level.

- **Low-density-lipoprotein (LDL) cholesterol = "bad" cholesterol**
  A low LDL cholesterol level is considered good for your heart health. However, your LDL number should no longer be the main factor in guiding treatment to prevent heart attack and stroke, according to the latest guidelines from the American Heart Association. For patients taking statins, the guidelines say they no longer need to get LDL cholesterol levels down to a specific target number. Lifestyle factors such as a diet high in saturated and trans-fats can raise LDL cholesterol.
- **High-density-lipoprotein (HDL) cholesterol = "good" cholesterol**
  With HDL (good) cholesterol, higher levels are typically better. Low HDL cholesterol puts you at higher risk for heart disease. People with high blood triglycerides usually also have lower HDL cholesterol. Genetic factors, type 2 diabetes, smoking, being overweight and being sedentary can all result in lower HDL cholesterol.
- **Triglycerides**
  Triglyceride is the most common type of fat in the body. Normal triglyceride levels vary by age and sex. A high triglyceride level combined with low HDL cholesterol or high LDL cholesterol is associated with atherosclerosis, the buildup of fatty deposits in artery walls that increases the risk for heart attack and stroke

LOWER HIGH BLOOD PRESSURE

It's a major risk factor for stroke a leading cause of disability in the United States. Stroke recovery is difficult at best and you could be disabled for life. Shake that salt habit, take your medications as recommended by your doctor and get moving. Those numbers need to get down and stay down. **An optimal blood pressure reading is less than 120/80 mmHg**.

Be physically active every day

Be physically active every day. Research has shown that 3–4 sessions per week, lasting on average 40 minutes per session, and involving moderate-to-vigorous-intensity physical activity can help lower blood pressure, lower cholesterol and keep your weight at a healthy level. But something IS better than nothing. If you're doing nothing now, start out slow. Even 10 minutes at a time may offer some health benefits. Studies show that people who have achieved even a moderate level of fitness are much less likely to die early than those with a low fitness level.

Aim for a healthy weight

Obesity is highly prevalent in America, not only for adults but also for children. Fad diets and supplements are not the answer. Good nutrition, controlling calorie intake and physical activity are the only way to maintain a healthy weight. Obesity places you at risk for high cholesterol, high blood pressure and insulin resistance, a precursor of type 2 diabetes — the very factors that heighten your risk of cardiovascular disease. Your Body Mass Index (BMI) can help tell you if your weight is healthy.

Manage diabetes

At least 68% of people >65 years of age with DM die of some form of HD; 16% die of stroke . Other risk factors, such as high blood pressure, high cholesterol, smoking, obesity, and lack of physical activity can greatly increase a person with diabetes' chance of developing cardiovascular disease.

Reduce stress

A few studies have noted a relationship between coronary heart disease risk and stress in a person's life that may affect the risk factors for heart disease and stroke. For example, people under stress may overeat, start smoking or smoke more than they otherwise would. Research has even shown that stress reaction in young adults predicts middle-age blood pressure risk.

Limit alcohol

Drinking too much alcohol can raise blood pressure, increase cardiomyopathy, stroke, cancer, and other diseases It can contribute to high triglycerides and produce irregular heartbeats. Excessive alcohol consumption contributes to obesity, alcoholism, suicide and accidents.

However, there is a cardio protective effect of moderate alcohol consumption. If you drink, limit your alcohol consumption to no more than two drinks per day for men and no more than one drink per day for women. The National Institute on Alcohol Abuse and Alcoholism defines on drink as 1-1/2 fluid ounces (fl oz) of 80-proof spirits (such as bourbon, Scotch, vodka, gin, etc.), 5 fl oz of wine, or 12 fl oz of regular beer. It's not recommended that non-drinkers start using alcohol or that drinkers increase the amount they drink.

ELECTROLYTES AND ITS NEED IN ATHLETIC PERFORMANCE

Electrolytes are essential to athletic performance. Common electrolytes include calcium, chloride, magnesium, phosphorous, potassium and sodium Electrolytes influence a variety of bodily functions. Because electrolytes are lost primarily through sweat, you must continually replace lost electrolytes through fluid and food intake. Electrolytes can boost athletic performance in the following ways:

- Strengthens the muscles and bones
- Promotes sleep
- Improves cognition

- Strengthens immunity
- More effective energy production
    - On average, athletes sweat much more than the standard, untrained person. When the body starts to overheat the nervous system stimulates sweat glands, which prompts the body to begin perspiring in an attempt to cool the body down.
    - Recent studies reveal that the reason athletes sweat more, and produce more sweat than the average person, is because they are more fit, and participate in more anaerobic activity which requires the body to work harder to pump oxygen and blood continuously to their muscles. Whenever the body produces perspiration, it depletes necessary nutrients and lowers hydration levels, so it is essential that athletes refuel throughout and most importantly, after a workout to give the body what it needs to recover and return to equilibrium and healthy hydration levels.
    - In the middle of a tough workout, it's easy to forget to hydrate. **Dehydration** can ruin an otherwise solid workout, and if left unchecked, can reduce an athlete's training capacity over the course of a whole season. In a slightly dehydrated state, 1-2% reduction in body weight through fluid loss, athletes perceived exertion goes up (how much work athletes feel they're putting in), and performance goes down. Moreover, athletes' post-workout recovery slows down when the fluid volume is at a sub-optimal level for quick delivery of nutrients and oxygen to working muscle tissues and removal of waste products from the bloodstream.

Why are Electrolytes Important for Elite Athletes?

- Electrolytes are positively and negatively charged ions that conduct electrical activity to perform various functions within the body. **Electrolytes must be present in proper concentrations to maintain fluid balance, muscle contraction, and neural activity—all essential to high performance and basic daily functions.** The kidneys control electrolyte balance by excreting or conserving them. Water is drawn to local concentrations of electrolytes, so it follows wherever they go.
- When athletes sweat, they're losing electrolytes primarily in the form of sodium (Na^+) and chloride (Cl^-), so when you start to replace lost fluids, athletes should replace the electrolytes as well. Potassium (K^+), Magnesium (Mg^{2+}), and Calcium (Ca^{2+}) are electrolytes also lost through sweating.
- In order for athletes to attempt to achieve peak performance, it's essential that they hydrate and rehydrate their bodies with the proper amount of electrolytes.

How Many Electrolytes are Lost?

- The amount of electrolytes that are in sweat, is why sweat tastes salty. Some athletes have saltier sweat than others due to simple genetic differences, diet, sweat rate, and heat acclimatization. Athletes who feel dizzy, lightheaded, or experience muscular cramping post-workout may be salty sweaters experiencing an electrolyte imbalance.
- If athletes only drink water to rehydrate, they could be diluting their internal electrolyte concentration and throwing their bodies further off balance. While the human body is good at regulating itself, elite training is strenuous and long enough that athletes must actively pump electrolytes in to support the rehydration process.

When Should Athletes Replace Electrolytes?

BEFORE WORKOUT:

- If athletes are "salty sweaters" then they might consider drinking an electrolyte beverage or having a salty snack prior to a heavy workout (> 60 – 90 minutes) or one that is performed in hot temperatures.

DURING WORKOUT:

- Electrolyte products that contain sodium and carbohydrates are ideal during exercise. The sodium replaces lost electrolytes and helps the body utilize carbohydrates. Many sports drinks contain sugar in such high concentrations that athletes don't feel comfortable drinking mid-workout. Athletes can 1) look for drinks that are lower in sugar (yet still avoid artificial sweeteners), 2) alternate between the sports drink and water during practice, or 3) choose a powdered electrolyte so you can control how concentrated your drink is.
- It is easier to retain water in the body with the intake of salt, because water naturally follows those molecules. Ingesting salty foods or a sports drink can help you rehydrate faster than by drinking water alone.

What is the Recommended Amount of Fluids and Electrolytes?

- This depends on the type and duration of exercise - within 60-90 minutes of exercise, athletes can lose around 1-2% body weight in the form of fluids. An athlete's weight (say 150 lbs) multiplied by this percentage is the amount of fluid athletes should try to drink as a replacement (150lbs x 0.01 to 0.02 = 1.5 to 3 lbs body weight loss, or 24 to 48 fl oz). Given a hot day or a high sweat rate, this number can increase.

- For exercise duration under 2 hours, a beverage containing 60-120 mg sodium and 15-45 mg potassium per 8-oz serving will be effective for electrolyte replacement. Check the label to find the desired ratio of electrolytes to carbohydrates.
- Extreme distance athletes like marathon (or ultra-marathon) runners and Ironman triathletes may need a much higher concentration of electrolytes to be delivered to their system, with fewer carbohydrates and minimal liquid. Athletes in this category should shoot for anywhere between 180-250 mg sodium and 10-100 mg potassium per 8-oz serving.
- Remember that sodium, rather than potassium, plays the primary role in electrolyte replacement and is thus a more important factor when deciding which electrolyte product to purchase.

UNIT V - HEALTH PROMOTION

Nutrition for the promotion of health Physical exercise for the health promotion

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What is nutrition in health promotion?

Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases (such as diabetes and cardiovascular disease), and longevity.

BENEFITS OF REGULAR PHYSICAL ACTIVITY

The health benefits of regular exercise and physical activity:

The health benefits of regular exercise and physical activity are hard to ignore. Everyone benefits from exercise, regardless of age, sex or physical ability.

Need more convincing to get moving? Check out these seven ways that exercise can lead to a happier, healthier you.

1. Exercise controls weight

Exercise can help prevent excess weight gain or help maintain weight loss. When you engage in physical activity, you burn calories. The more intense the activity, the more calories you burn.

Regular trips to the gym are great, but don't worry if you can't find a large chunk of time to exercise every day. Any amount of activity is better than none at all. To reap the benefits of exercise, just get more active throughout your day — take the stairs instead of the elevator or rev up your household chores. Consistency is key.

2. Exercise combats health conditions and diseases

Worried about heart disease? Hoping to prevent high blood pressure? No matter what your current weight is, being active boosts high-density lipoprotein (HDL) cholesterol, the "good" cholesterol, and it decreases unhealthy triglycerides. This one-two punch keeps your blood flowing smoothly, which decreases your risk of cardiovascular diseases.

Regular exercise helps prevent or manage many health problems and concerns, including:

- Stroke
- Metabolic syndrome
- High blood pressure
- Type 2 diabetes
- Depression
- Anxiety
- Many types of cancer
- Arthritis
- Falls

It can also help improve cognitive function and helps lower the risk of death from all causes.

3. Exercise improves mood

Need an emotional lift? Or need to distress after a stressful day? A gym session or brisk walk can help. Physical activity stimulates various brain chemicals that may leave you feeling happier, more relaxed and less anxious.

You may also feel better about your appearance and yourself when you exercise regularly, which can boost your confidence and improve your self-esteem.

4. Exercise boosts energy

Winded by grocery shopping or household chores? Regular physical activity can improve your muscle strength and boost your endurance.

Exercise delivers oxygen and nutrients to your tissues and helps your cardiovascular system work more efficiently. And when your heart and lung health improve, you have more energy to tackle daily chores.

5. Exercise promotes better sleep

Struggling to snooze? Regular physical activity can help you fall asleep faster, get better sleep and deepen your sleep. Just don't exercise too close to bedtime, or you may be too energized to go to sleep.

6. Exercise puts the spark back into your sex life

Do you feel too tired or too out of shape to enjoy physical intimacy? Regular physical activity can improve energy levels and increase your confidence about your physical appearance, which may boost your sex life.

But there's even more to it than that. Regular physical activity may enhance arousal for women. And men who exercise regularly are less likely to have problems with erectile dysfunction than are men who don't exercise.

7. Exercise can be fun ... and social!

Exercise and physical activity can be enjoyable. They give you a chance to unwind, enjoy the outdoors or simply engage in activities that make you happy. Physical activity can also help you connect with family or friends in a fun social setting.

So take a dance class, hit the hiking trails or join a soccer team. Find a physical activity you enjoy, and just do it. Bored? Try something new, or do something with friends or family.

The bottom line on exercise

Exercise and physical activity are great ways to feel better, boost your health and have fun. For most healthy adults, the U.S. Department of Health and Human Services recommends these exercise guidelines:

- **Aerobic activity.** Get at least 150 minutes of moderate aerobic activity or 75 minutes of vigorous aerobic activity a week, or a combination of moderate and vigorous activity. The guidelines suggest that you spread out this exercise during the course of a week. To provide even greater health benefit and to assist with weight loss or maintaining weight loss, at least 300 minutes a week is recommended. But even small amounts of physical activity are helpful. Being active for short periods of time throughout the day can add up to provide health benefit.
- **Strength training.** Do strength training exercises for all major muscle groups at least two times a week. Aim to do a single set of each exercise using a weight or resistance level heavy enough to tire your muscles after about 12 to 15 repetitions.

Moderate aerobic exercise includes activities such as brisk walking, biking, swimming and mowing the lawn. Vigorous aerobic exercise includes activities such as running, heavy yardwork and aerobic dancing. Strength training can include use of weight machines, your own body weight, heavy bags, resistance tubing or resistance paddles in the water, or activities such as rock climbing.

If you want to lose weight, meet specific fitness goals or get even more benefits, you may need to ramp up your moderate aerobic activity even more.

Remember to check with your doctor before starting a new exercise program, especially if you have any concerns about your fitness, haven't exercised for a long time, have chronic health problems, such as heart disease, diabetes or arthritis.