

Red Star-Personal Fitness and Healthy Living

It is important for cadets to increase their physical fitness levels, beginning with their cardiovascular fitness. Performing the PACER for the first time will give each cadet an indication of where they currently are in relation to cardiovascular fitness and how they would like to improve.

Heart Rate and Pulse:

An individual's heart rate/pulse may be taken in two locations. It can be taken at the radial artery and the carotid artery. To find the heart rate/pulse, count the number of beats in a 30-second time frame and multiply that number by two.

Radial Pulse

The first is the radial pulse, which is the pulse found on the inside of the wrist just below the base of the thumb. This pulse is taken by placing the tips of the index and middle fingers gently at the radial artery. The thumb should never be used to take a pulse as the thumb has its own pulse



Carotid Pulse

The second is the carotid pulse, which is found on both sides in the groove of the neck. This pulse is taken by placing the tips of the index and middle fingers gently at the carotid artery in the groove of the neck.



Resting Heart Rate

Resting heart rate is the heart rate of an individual when they are at rest and are relaxed. The normal range for an adult (in this case an adult is considered anyone over the age of eight) is between 60 and 80 beats per minute.

Target heart Rate

The target heart rate is the optimum heart rate at which an individual should train in order to get an effective workout. To calculate an individual's target heart rate, the maximum heart rate (MHR) must first be determined. The MHR is the maximum number of times that the heart is designed to beat in one minute. This is calculated by subtracting an individual's age from 220. The MHR is then multiplied by 0.6 to get the lower exercise range and by 0.8 to get the higher exercise range. The target heart rate for training should fall within this range.

$$220 - \text{Age} = \text{MHR}$$

$$\text{MHR} \times 0.6 = \text{Lower Exercise Range}$$

$$\text{MHR} \times 0.8 = \text{Higher Exercise Range}$$

Example for a 12 year old:

$$220 - 12 = 208$$

$$208 \times 0.6 = 125$$

$$208 \times 0.8 = 166$$

The following table lists the exercise ranges for 12 to 18 year olds.

Age	Lower Exercise Range	Higher Exercise Range
12	125	166
13	124	166
14	124	165
15	123	164
16	122	163
17	122	162
18	121	162

Those individuals who are just beginning to work out, should work within the lower end of the exercise range and build up. As an individual

increases their level of fitness, they can work within the higher end of the exercise range.

Methods to Increase Cardiovascular Endurance:

Pacing

Proper pacing is essential to every runner. Pacing is the speed that should be run in order to cover the distance. Knowing a runner's pacing speed is essential to understanding their personal level of fitness. Each individual should pace themselves based on the signs felt from the body and the environmental conditions. Not everyone will be able to run as fast or as long as everyone else in the group. An individual who cannot speak as they are running is considered to be running too fast or too long. This will prevent an individual from being able to run as long as runners who pace themselves correctly. The "talk test" can be used to determine if someone is running at a proper pace for their level of fitness. An individual who is not able to maintain a conversation is running too fast.

Running Form

Having a proper running form can make running easier on the body and can increase individual performance. Many of the strategies will come with practice. Basic strategies to help an individual become more efficient include:

- standing upright with the head, shoulders, and hips lined up over the feet;
- keeping the head up and focusing on something ahead of you;
- keeping the chest out in a position that will allow the lungs to gain maximum breathing efficiency;
- keeping the hips slightly forward in a natural alignment;
- allowing the arms to move to the front with the elbows in and the arms coming up in a straight motion; and
- planting the feet directly under the body at the centre of gravity.

Progression

Progression is the ability to increase the pace and distance that can be run in a specific amount of time. This will increase endurance over time.

Participating in any cardiovascular activity will help increase the level of cardiovascular endurance in an individual.

Warming Up and Cooling Down:

A warm up will be composed of light cardiovascular activities designed to:

- stretch the muscles and ligaments;
- gradually increase respiratory action and heart rate;
- reduce the chances of injury;
- expand the muscles' capillaries to accommodate the increase in blood circulation which occurs during physical activity; and
- raise muscle temperature to facilitate reactions in muscle tissue.

The following factors are important to remember while stretching in order to get ready for physical activity and to help prevent injury:

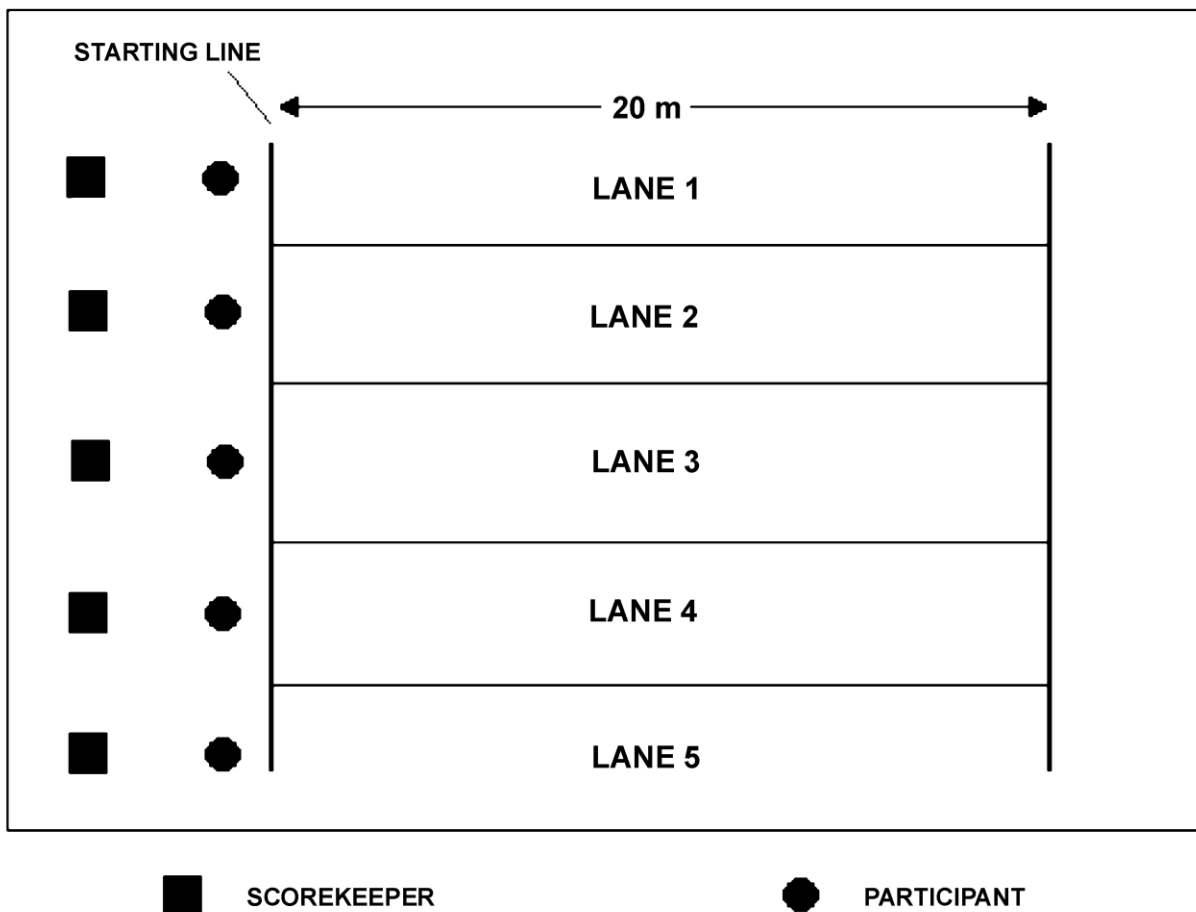
- Stretch all major muscle groups, including your back, chest, legs, and shoulders.
- Never bounce when stretching.
- Hold each stretch for up to 30 seconds to let the muscles release fully.
- Repeat each stretch two to three times.
- When holding a stretch, support your limbs at the joint.
- Static stretching, which is stretching a muscle and holding it in this position without discomfort for 10 to 30 seconds, is considered the safest method of stretching.
- Stretching helps to relax your muscles and improves flexibility, which is the range of movement about your joints.
- As a guide, allow 10 minutes of pre-exercise stretching for every one hour of exercise.
- The stretches used should focus on the areas of the body that will be used the most during the given sport.

A cool down will be composed of light cardiovascular activities meant to allow the body time to slowly recover from physical activity and to help prevent injury. Cool downs prepare the respiratory system to return to its

normal state, stretch muscles and ligaments to help relax them, and restore them to their resting length.

The Pacer:

The PACER consists of running back and forth a distance of 20 m, at a specified pace that increases each minute. Each cadet will be expected to continue as long as possible. The PACER will be set up with two lines (pylons) a distance of 20 m apart. A number of 40 to 60 inch lanes will be set up for the run,



When running the PACER, cadets will begin after the five-second countdown when the initial beep sounds. The cadets must then run to the opposite line and touch the line by the time the beep sounds. At the sound of the single beep they must turn around and then run back to the opposite

line. This continues with the sound of each beep. Every minute, a triple beep will sound that alerts the cadets the pace will increase. If a cadet reaches the line before the beep, they must wait at the line for the next beep to sound before continuing in the other direction. If a cadet does not reach the line before the beep, they must turn around where they are and return to the other line to get back on pace. The second time a cadet does not cross the opposite line before the beep, the cadet has completed the run.

The results will be recorded on the PACER Individual Score Sheet. Cadets will be divided into pairs for the PACER. One cadet will run while their partner records their results. Once the first group has finished running, the groups will switch.

Healthy Food Choices:

It is important for cadets to identify healthy food choices because it is a significant component of living a healthy lifestyle. Choosing healthy foods may help the body to grow strong and help to prevent illnesses.

Canada's Food Guide

Health Canada, Canada's Food Guide, Her Majesty the Queen in Right of Canada, describes how much of each type of food is required as part of a healthy eating pattern. There are four food groups in the guide; vegetables and fruit, grain products, milk and alternatives, and meat and alternatives. The front page of the guide shows a rainbow with samples of the type of foods that fit in these four categories. The size of the arcs in the rainbow represents the proportion of each food group that makes up a healthy eating pattern.

Vegetables and Fruit

Consuming plenty of vegetables and fruit may help reduce the risk of cardiovascular disease and certain types of cancer. This food group provides nutrients such as carbohydrates, vitamin A, vitamin C, potassium, magnesium, and B vitamins. Vegetables and fruit are the most prominent food group in the guide because of the important role these foods play in healthy eating. Examples of foods from the vegetable and fruit group include:

- fresh vegetables/fruit,
- frozen vegetables/fruit,
- canned vegetables/fruit,
- dried vegetables/fruit, and
- vegetables/fruit juices

Grain Products

Consuming the required amount of grain products may help to reduce the risk of cardiovascular disease. Grain products, particularly whole grains, are a source of fibre and are usually low in fat. Whole grains contain all three edible layers of the grain seed or kernel, which provides a greater combination of nutrients. This food group provides nutrients such as carbohydrates, B vitamins (e.g. thiamin, riboflavin, niacin and folate), iron, zinc, and magnesium. The grain products food group is the second most prominent food group in the guide. Examples of foods from the grain products group include:

- grain,
- cereal,
- pasta,
- rice, and
- products made with grain flour (including corn flour).

Milk and Alternatives

Consuming the required amount of milk and alternatives may help to develop strong bones and reduce the risk of osteoporosis. This food group provides nutrients such as calcium, vitamin A, vitamin D, vitamin B12, riboflavin, zinc, magnesium, potassium, protein and fat. Examples of foods from the milk and alternatives group include:

- milk products, such as:
 - canned milk (evaporated milk),
 - powdered milk,
 - cheese, and
 - yogurt; and
- alternative milk products, such as fortified soy beverage.

Meat and Alternatives

Consuming the required amount of meat and alternatives food group provides nutrients such as iron, zinc, magnesium, B vitamins (e.g. thiamin, riboflavin, niacin, vitamin B6, and vitamin B12), protein, and fat. Examples of foods from the meat and alternatives group include:

- meat products, such as:
 - eggs,
 - fish,
 - meat,
 - poultry, and
 - shellfish; and
- alternative meat products, such as:
 - legumes (e.g. chick peas),
 - kidney beans,
 - lentils, nuts/seeds, and
 - tofu.

Food Guide Servings

A food guide serving is a specified quantity of food from each of the food groups. It is used to help people understand how much food is recommended every day from each of these groups. This is generally close to what a person would eat in one sitting (e.g. one apple). When eating out, food portions are often large and contain more than one serving of a food group. It is important to recognize the food groups that make up a meal and how much food is on the plate, in order to count the food guide servings in a meal.

Recommended Daily Intake

The recommended daily intake outlined in Health Canada, Canada's Food Guide, Her Majesty the Queen in Right of Canada, (p. 2) describes what amount of food people should eat based on age and gender. The recommended number of servings a child (male and female) between the ages of 9 to 13 should eat in one day is as follows

- six servings of vegetables and fruit,
- six servings of grain products,
- three to four servings of milk and alternatives, and
- one to two servings of meat and alternatives.

Following the recommended daily intake in Health Canada, Canada's Food Guide, Her Majesty the Queen in Right of Canada, will help people to:

- take in the required vitamins, minerals and other nutrients;
- reduce the risk of obesity, type two diabetes, heart disease, certain types of cancer and osteoporosis; and
- achieve overall health and vitality.

Choosing healthy foods may help the body to grow strong and help to prevent illnesses. This knowledge may also assist in preparing nutritious meals. Identifying healthy food choices is important to choosing a healthy lifestyle.

Healthy Lifestyle:

It is important for cadets to identify the benefits of a healthy lifestyle because it is key to becoming physically fit, which is one of the aims of the Cadet Program.

Smoking

Known facts about smoking include:

- adolescence is the usual time a person will start smoking;
- youth in grades six and seven are considered to be at the critical stage for deciding whether to experiment with smoking; and
- cigarette smoking is more addictive and harder to quit than some other substances such as heroin and cocaine.

Physical effects of smoking include:

- dry skin and premature wrinkling;
- a longer healing time for a smoker's acne;
- hair loss in some teenagers;
- yellow teeth and tooth decay; and
- an increased occurrence of oral cancer in some people.

It is estimated that 55% of young men and 51% of young women who start smoking by the age of 15 will die before age 70 if they continue to smoke. Tobacco kills more than 40 000 Canadians every year.

Consequences of smoking may include:

- cancer of the lungs, mouth, sinuses, throat, brain, breast, uterus, bladder, kidney, thyroid, lymph glands, and blood;
- serious ailments such as bronchitis, pneumonia, emphysema, strokes, heart attacks, ulcers, cataracts, gum disease, tooth decay, ear infections, dry skin, early aging, and impotence;
- respiratory problems such as increased coughing, phlegm, wheezing, chest colds, and shortness of breath;
- asthma attacks or increased asthma symptoms;
- cold fingers and toes due to poor circulation; and
- a dulled sense of smell and taste.

Nutritional Choices

Following Health Canada, Canada's Food Guide, Her Majesty the Queen in Right of Canada, will ensure a person eats the amount and type of food that is recommended to help achieve a healthy lifestyle. Eating the amount and type of food recommended and following the tips in Health Canada, Canada's Food Guide, Her Majesty the Queen in Right of Canada, will help:

- meet the body's needs for vitamins, minerals, and other nutrients;
- reduce the risk of obesity, type 2 diabetes, heart disease, certain types of cancer, and osteoporosis; and
- contribute to overall health and vitality.

Just as important as eating the right amount of food is eating the right types of foods. People should be encouraged to eat foods that are lower in fat, sugar, and salt. The benefits of eating well include:

- better overall health,
- lower risk of disease,
- healthy body weight,
- feeling and looking better,
- more energy, and
- stronger muscles and bones.

Regular Physical Activity

Benefits of regular physical activity contribute to the following:

- overall health,
- improved fitness,
- better posture and balance,
- weight control,
- stronger bones and muscles,
- energy level, and
- an increase in relaxation and reduction in stress.

Health risks that may result from inactivity include:

- premature death,
- heart disease,
- obesity,
- high blood pressure,
- adult-onset diabetes (type 2),
- osteoporosis,
- stroke,
- depression, and
- various forms of cancer.

63% of Canadians are not active enough to get the health benefits they need from physical activity. Youth require 60 to 90 minutes of physical activity every day

Physical Benefits of a Healthy Lifestyle

Healthy Growth and Development Studies, in recent years, have shown that over half of young people are not active enough for healthy growth and development. According to the Canadian Community Health Survey in 2000–2001, 56% of Canadian's aged 12 to 19 were physically inactive and as many as 82% may not have been active enough to meet international guidelines for optimal growth and development.

Healthy Heart

Eating more nutritious foods, not smoking, and being physically active can help maintain a healthy heart. A healthy body weight, for example, can help to lower risk factors for heart disease by decreasing blood cholesterol, fat levels, and high blood pressure. Cardiovascular disease, such as heart disease, stroke, and atherosclerosis (ather-o-skleh-ro-sis) – hardening and narrowing of the arteries, is the number one cause of premature death in Canada.

Stronger Bones and Muscles

Physical activity, especially strength activities, can contribute to the maintenance of bone mass through adulthood, by helping develop the bony and muscular tissue during childhood. Daily physical activity in adolescence and early adulthood is positively correlated to mineral density and the skeleton's bone density. This development of mineral density and bone mass may help reduce the risk of osteoporosis later in life. Strength activities will lead to stronger muscles and help them stay strong over time. Stronger bones and muscles can also lead to better posture and balance among people of all ages.

Weight Control

Physical activity affects body composition and helps weight loss. Active individuals are at less risk of becoming overweight. Having a healthy body means maintaining a healthy body weight. Having a healthy weight does not necessarily mean being extremely slim and having a low body weight. A healthy body weight should encourage physical, social, and psychological well-being. In 1988, Health and Welfare Canada introduced the "healthy weights strategy". This strategy promotes healthy eating opposed to dieting and regular physical activity versus intense exercise. For adults, healthy body weight can be determined by the Body Mass Index (BMI) and the waist-hip ratio (WHR).

According to the World Health Organization (WHO) in 2002, there were approximately one billion people in the world who were overweight or obese and only 800 million who were hungry/starving or underweight. According to the Canadian Community Health Survey conducted in 2004, obesity rates in adolescents aged 12 to 17 have tripled from 3% to 9% in the past 25 years.

Being inactive and/or overweight increases the risk of heart disease, osteoarthritis, diabetes, various cancers, and back injuries.

Lower Health Risks

Regular participation in at least 30 minutes of moderate physical activity can help prevent some chronic conditions, such as:

- Cardiovascular Disease (CVD). Regular physical activity can reduce the risk of heart disease by as much as 50%.
- Osteoporosis. In Canada, about one out of four women and one out of eight men over 50 years of age, develops osteoporosis. The risk of osteoporosis may be reduced through regular physical activity during childhood and adolescence.
- Cancer. Regular physical activity can help in the prevention of certain types of cancer, such as breast and colon cancer. Research shows that overall 30% to 35% of all cancers can be prevented by eating well, maintaining a healthy weight, and by including physical activity into one's lifestyle.
- Type 2 Diabetes. Physical activity, together with decreased fat intake, can help in the prevention of type 2 diabetes by as much as 58%.

Studies have shown that females are less active than males. In 2000, only 30% of females and 40% of males were considered active enough to meet the minimum requirements of daily physical activity. This dropped to 12% for females and 24% for males by 2002.

Psychological Benefits of a Healthy Lifestyle

Positive Self-esteem

Positive self-esteem requires a person to have a good opinion of their own character and abilities. Self-esteem can be measured by how worthy individuals feel in various social, physical, and academic situations. Individuals with high self-esteem generally view themselves in a positive manner and can appreciate their abilities, as well as their potential and limitations. Those with low self-esteem generally tend to be more passive and dependent in reacting to stress and demands and are more likely to

conform to social pressures, while also being pessimistic about their abilities.

Making new friends is easier when a youth participates in activities involving other youth. For example, if an individual participates in a sports team or a recreational club, there are more opportunities to meet new people. As well, an individual who is living a healthy lifestyle, is often more self-confident, making it easier to meet new people and make friends. According to the Canadian Fitness and Lifestyle Research Institute, physical activity appears to have a positive influence on youth's social lives and the number of same-gender and opposite gender friends they have.

Positive Self/Body Image

Self/body image is how an individual perceives their own physical characteristics and how they evaluate themselves based on this perception of self. This is then formulated into a self/body image as an individual perceives their own body, how it looks to them, and how they think it looks to others. Having a positive self/body image comes with the idea that a wider range of body weights, shapes, and sizes are healthy and normal. The reality of genetics encompasses the fact that not all people can be the same shape and size and that not everyone can or should meet the body type seen often in the media.

Higher Energy

Nutrition choices have a direct effect on the amount of energy the body produces. Although the body requires foods from all four food groups, Health Canada recommends that 55% of calories should come from carbohydrates, which should be in the form of starches and natural sugars. These starches and sugars are digested and changed into glucose and are burned during regular physical activity.

Physical activity can also lead to high energy as it determines the amount of energy expended and therefore leads to energy balance (the amount of energy ingested in the forms of carbohydrates, fat, protein and alcohol, should equal the amount expended). Physical activity increases oxygen throughout the body. Endorphins are also increased, therefore, leading to higher levels of energy. Many studies show that physically active youth tend to sleep and eat better than those who are more sedentary or less active.

Reduced Stress/Increased Relaxation

Regular physical activity appears to be associated with better self-esteem and a decrease in anxiety and depression symptoms in normal situations. Flexibility activities are especially effective in ensuring the muscles are relaxed. Individuals who are more physically active and eat balanced, nutritious meals are more likely to have positive self-esteem and self/body image, leading to a reduction in anxiety and negative feelings about their sense of self.

It is important to learn the methods to achieve a healthy lifestyle as choices made regarding health during youth will have an effect into adulthood. Making healthy food choices and participating in regular physical activity will increase energy, prevent diseases, increase strength, and in many cases, lead to a healthier lifestyle.