CARDIOVASCULAR HEALTH ISSUES

Tennis and the Heart

The heart is the pump in the energy transport system. The circulatory system driven by the heart will transport nutrients, including oxygen, to the working muscles and remove the waste products including carbon dioxide and water away from the working muscles.

Since the circulatory system also helps control body temperature, it is a factor in dissipating heat. Tennis places medium to high demands on the cardiovascular system, and these demands are higher during singles than doubles.

Tennis may have cardiovascular benefits because it is an aerobic activity. A significant proportion, of the energy expended from playing tennis is supplied by the aerobic energy system.

In addition, tennis also meets and maintains the maximum heart rate criteria (60% to 90%) recommended for aerobic conditioning by the American College of Sports Medicine. This may lead to a training effect of the heart, known as "athlete's heart".

Athlete's Heart

Athlete's heart is the term used to describe the adaptations of the heart associated with long-term athletic training. It is a normal healthy adaptation of the heart. Modern tennis has evolved into a sport with high physical demands, reflected by powerful strokes, fast rallies and extended hours of play.

It is therefore not surprising that most professional players develop an athlete's heart. Like other muscles, your heart responds in a healthy way to specific training. When training is principally aerobic, athlete's heart is characterised by an increase in the heart's size (hypertrophy) and a low resting heart rate (bradycardia).

Besides lowering the resting pulse rate, training makes the pulse more forceful, producing a harmless murmur as blood flows through the heart and blood vessels. Furthermore, the amount of blood ejected from the chambers with each beat (stroke volume) will also increase. These adaptations allow your heart to pump blood with maximum efficiency.

On the other hand, weight-lifting or resistance training will cause your heart muscle to thicken with less enlargement of its cavity. This adaptation enables it to generate the increased blood pressure necessary for anaerobic exercise but doesn't contribute as much to a more efficient stroke volume or a lower pulse rate. If you combine aerobic and resistance training, your heart will of course show the benefits of both types of exercise.

People who regularly play tennis have lower rates of cardiovascular disease, such as hypertension and coronary artery disease, but a trained heart is not immune to heart problems. The following section will focus on cardiovascular disease, the risk factors associated with the conditions, and how tennis can help to prevent/reduce the risk of cardiovascular disease.

Cardiovascular Disease (CVD)

Heart disease is the world's number one killer. It is responsible for one in every three deaths. It affects women and men with no respect for geography or economics. Cardiovascular disease does not just affect old people. More than one-third of these deaths occur in middle-aged adults.

Children are at increasing risk, for example, through tobacco smoking (active and passive), overweight, obesity and lack of physical activity. Globally, cardiovascular diseases account for as many deaths in young and middle-aged adults as HIV/AIDS.

Risk Factors

- High cholesterol
- Diabetes
- High blood pressure
- Tobacco
- Lack of physical activity
- Unhealthy nutrition
- Overweight/Obesity
- Heavy alcohol intake
- Stress
- Family history

Atherosclerosis

Atherosclerosis is the gradual build-up of fatty deposits (atheroma) in the arteries, leading to hardening and narrowing of these arteries. The fatty build-up or plaque can break open and lead to the formation of a blood clot that seals the break. The cycle of fatty-build-up, plaque rupture, and blood clot formation causes the arteries to narrow, reducing blood flow.

Myocardial Infarction (Heart Attack)

A heart attack occurs when a blood clot in one or more coronary arteries suddenly cuts off most or all blood supply to part of the heart. Heart muscle cells in the affected region do not receive enough oxygen carrying blood and begin to die.

The higher up the coronary artery the blockage occurs, and the more time that passes without treatment to restore blood flow, the greater the damage to the heart.

Hypertension (High Blood Pressure)

High blood pressure or hypertension is diagnosed when blood pressure is consistently 160/90 mmHg or higher.

High blood pressure appears to be both a disease and a risk factor for other diseases.

High blood pressure is generally without symptoms, but may lead to premature death secondary to stroke, heart disease, or kidney failure.

Tennis and Cardiovascular Disease

Physical activity helps control weight and reduces stress, anxiety and feelings of depression, risk factors of CVD, increase HDL cholesterol, lower triglycerides and the proneness to thrombosis.

Moderate activity, such as playing tennis for an hour three times a week, is associated with significant reductions in the incidence and mortality of cardiovascular disease.

A comparative study of tennis players and non-athletes showed that regular tennis increases the concentration of the vascular-protecting HDL-Cholesterol in the blood and, therefore, decreases harmful deposits in arterial vessels (VODAK et al., 1980). Increasing the duration of tennis play results in an augmented production of energy from fat stores (20-40%).

By playing tennis at lower intensity for longer time periods, fat metabolism can be increased. Over a period of years, the concentration of HDL-Cholesterol in the blood is increased, which has a protective effect against arteriosclerosis.