



**RISK FACTORS FOR PREVENTING CARDIAC ARREST**

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**ABSTRACT**

Heart disease is one of the leading cause of death in India. The causes and prevention of heart disease have been studied for years, and new information is emerging. For the last several decades, saturated fat and cholesterol have been thought to be major contributors to coronary artery disease, and therefore people are typically advised to strictly limit these in their diet. However, recent studies are indicating that it may not be wise to strictly limit the intake of dietary saturated fatty acids or replace them with polyunsaturated fatty acids when taking other health conditions into consideration. Depending on a person's genetics, diet may or may not be an important factor in preventing heart disease. Exercise is also beneficial for everyone in preventing heart disease. When considering human development, including the negative effects of heart disease, humans still have a lot to learn about the human body and the interaction of diet, the environment, and genetics. This paper discusses process for reducing Cardiac arrest.

**KEY WORDS:** Heart Disease, Heart Failure, Risk Factors.

**INTRODUCTION**

Heart disease develops when a combination of fatty material, calcium, and scar tissue (plaque) builds up in the arteries that supply the heart with blood. Through these arteries, called the coronary arteries, the heart muscle (myocardium) gets the oxygen and other nutrients it needs to pump blood. The plaque often narrows the artery so that the heart does not get enough blood<sup>[1-3]</sup>.

Your heart is one of your body's most important organs. Essentially a pump, the heart is a muscle made up of four chambers separated by valves and divided into two halves. Each half contains one chamber called an atrium and one called a ventricle. The atria (plural for atrium) collect blood, and the ventricles contract to push blood out of the heart. The right half of the heart pumps oxygen-poor blood (blood that has a low amount of oxygen) to the lungs where blood cells can obtain more oxygen. Then, the newly oxygenated blood travels from the lungs into the left atrium and the left ventricle. The left ventricle pumps the newly oxygen-rich blood to the organs and tissues of the body. This oxygen provides your body with energy and is essential to keep your body healthy<sup>[4]</sup>.

The general term used to cover malfunctions of the heart is Heart Disease, or sometimes Cardiac Disease ("Cardiac" is a Latin term for the heart). Though there

are multiple forms of heart disease, our discussion focuses on the two most common: Heart Attack and Heart Failure. This document is designed to teach you about heart attacks and heart failure: what causes these diseases, what forms these diseases take, and what can be done to treat these diseases when they occur. As both of these diseases are to some extent avoidable, we have also provided a discussion of preventative steps you can take to decrease your chances of having to deal with heart disease, or to minimize the negative effects of existing heart disease.

Note that though this information is as accurate as possible, it is no substitute for a qualified physician's advice. Consult with your doctor before making changes to any treatment regimen you may be prescribed, and before beginning any program of exercise or other significant lifestyle change, especially if you have a known heart problem or are a middle-aged or older adult. There is no substitute for your doctor's advice.

Although heart disease can occur in different forms, there is a common set of core risk factors that influence whether someone will ultimately be at risk for heart disease or not. We start our discussion of heart disease by describing these common risk factors, and then move on to cover specific conditions.

### Risk Factors

There are many factors that can increase your risk of getting heart disease. Some of these factors are out of your control, but many of them can be avoided by choosing to live a healthy lifestyle<sup>[6]</sup>. Some of the risk factors you cannot control are:

- **Gender:** Men have a greater risk than women for developing heart disease. Men also are at greater risk of having a heart attack at a younger age. Unfortunately, these facts often mislead women into believing that they are not at risk for heart disease. This is not true; heart disease is the number one killer of women (just like men). Women and men should both take steps to prevent heart disease.
- **Age:** Simply put, the older you get, the greater risk you run for developing heart disease. It is estimated that four out of five individuals who die of coronary heart disease are 65 years of age or older. Further, at older ages women are much more likely to have a fatal heart attack than men.
- **Family History:** A family history of heart disease, high blood pressure (hypertension), and diabetes increases the chance you will develop heart disease. People with biological relatives who have heart attacks at a young age (i.e., less than fifty-five years old) are considered to have a "strong" family history of heart disease and are at much higher individual risk.

A person's family history of heart disease risk factors may also be affected by their ethnic background. An uncontrolled high blood pressure increases an individual's chance of developing heart disease. While your family background is not a certain indication that you will get heart disease, it can greatly increase your chances.

Fortunately, there are many other risk factors for heart disease that can be addressed by lifestyle habits and regular preventative medical care. Some of the more controllable risk factors include:

- **Obesity:** People who are overweight are more likely to have high blood pressure, which increases the heart's overall workload. They also tend to have high cholesterol levels, which increases the chances of developing a blockage in blood flow to the heart. Furthermore, obesity increases a person's chance of developing diabetes, another major risk factor for heart disease. Getting regular exercise and eating a healthy diet are some of the best ways to control obesity and associated medical complications. Any complications caused by obesity should be evaluated and treated by your physician.
- **High Cholesterol:** Cholesterol, a type of fat molecule, is an essential part of healthy cell membranes, and as such, is an essential part of a healthy body. Too much cholesterol in your blood, however, puts you at increased risk of heart disease. High levels of cholesterol and other fatty substances can cause Atherosclerosis, a disease in which fatty plaques build up on blood vessel walls, restrict

blood flow to the heart and can ultimately cause a heart attack.

There are two different types of cholesterol: LDL (the so-called "bad cholesterol") and HDL (the "good" cholesterol). High levels of LDLs increase the chance of having a heart attack. In contrast, the higher your HDLs, the more protection is against heart attacks. Normally cholesterol levels are determined by a combination of age, gender, heredity, dietary choices and exercise. LDL cholesterol can be decreased through exercise and dietary changes such as avoiding saturated and trans fats. The best way to raise HDL cholesterol is through exercising.

If the cholesterol levels of someone cannot be kept at a safe level (the optimal number depends on age, family history, and medical history such as whether a person have diabetes or a history of heart attacks) with diet and exercise changes, then physician can consider a prescription for cholesterol-lowering medications. People with a history of diabetes or heart attacks need to keep their LDL cholesterol lower than individuals who do not have that history.

- **Smoking:** Smoking is a major risk factor for heart attacks. Among other health consequences, smoking causes people's blood to clot more easily, and raises blood pressure, thereby putting their heart at risk. In terms of a heart disease prevention strategy, the best protection is to never start, or to quit smoking altogether if you already smoke.
- **High Blood Pressure:** Uncontrolled blood pressure increases risk of heart disease. The higher the blood pressure, the harder it is for heart to pump blood throughout body. Like any other stressed muscle, an overloaded heart responds to exertion by growing bigger; by thickening its walls and increasing it's overall size. While these changes sound positive, they actually are harmful and are signs of heart disease. As the walls of the heart thicken, the heart chamber's volume becomes greatly reduced and less blood can be pumped each time the heart beats. Also, the thickened muscle walls make it harder for the heart to pump out what blood it is able to collect. Exercise, a healthy diet and medication (if needed) can all help maintain a healthy blood pressure and therefore, a healthy heart.
- **Diabetes:** As mentioned above, diabetes is a major risk factor for heart disease. A diabetic person's risk of developing heart disease is equivalent to the risk of a person who has had a previous heart attack. Diabetes is a disease of blood sugar regulation. People with diabetes are at greater risk for heart disease if their blood sugar is not kept under good control. In addition, diabetics also need to control their blood pressure and cholesterol levels. In fact, the cholesterol goal for a diabetic is as low as the goal for a person who has had a previous heart attack.

- **Other Factors:** Stress, drinking too much alcohol, and depression have all been linked to cardiovascular disease. Stress may cause some individuals to overeat, smoke, and/or drink excessively. Drinking can lead to higher blood pressure and obesity. While some studies have suggested that daily moderate alcohol intake (one drink a day) can reduce the risk of heart disease, there is a balance. Alcohol can be an addictive drug, and it is a source of 'empty' (i.e., with limited nutritional value) calories. These extra calories can cause weight problems and diabetes, both of which are associated with heart risks of their own.

### Process of Care

Analysis of the critical events preceding many adult cardiac arrests demonstrates many significant antecedents, usually related to abnormalities of the airway, breathing, and circulation. Additional factors include a failure to use a systematic approach to the assessment of critically ill patients, poor communication, lack of teamwork, and insufficient use of treatment can increase pain.

Hospital processes may also have significant effects on patient outcome. For example, patients who are transferred from intensive care units (ICUs) to general wards at night have an increased risk of in-hospital death compared with those transferred during the day and those transferred to high-dependency units. Higher nurse-patient staffing ratios are also associated with lower cardiac arrest rates and lower rates of pneumonia, shock, and death. These suggest that adequate patient monitoring and assessment are crucial to preventing adverse outcomes.

When patients deteriorate, they display common signs that represent failing respiratory, cardiovascular, and nervous systems. This is the basis for monitoring patients' vital signs. Abnormal physiology is common on general wards, yet the important physiological observations of sick patients are measured and recorded less frequently than is desirable.

To assist in the early detection of critical illness, every patient should have a documented plan for vital-signs monitoring that identifies which variables need to be measured and the frequency of measurement. In recent years, early warning scores (EWS), or 'calling-criteria' have been adopted by many hospitals to assist in the early detection of critical illness. EWS systems allocate points to routine vital-sign measurements on the basis of their deviation from an arbitrarily agreed 'normal' range.

The weighted score of one or more vital-sign observations, or more often the total EWS, is used to alert ward staff or critical care outreach teams to the deteriorating condition of the patient. Systems that incorporate 'calling criteria' activate a response when one or more routinely measured physiological variables

reach a pre-defined abnormal value. The sensitivity, specificity, and accuracy of EWS or calling-criteria systems to identify sick patients have been validated for several outcomes. Several studies have identified abnormalities of heart rate, blood pressure, respiratory rate, and conscious level as possible markers of impending critical events. The ability of these systems to predict cardiac arrest remains less than for other outcomes such as death or unanticipated ICU admission.

The medical and nursing response to a patient's abnormal physiology must be both appropriate and speedy, yet this is not always the case. Traditionally, the response to cardiac arrest has been reactive, with a cardiac arrest team attending the patient after the cardiac arrest. The use of such teams appears to improve survival in circumstances where no coordinated response to cardiac arrest existed previously. However, their impact in other settings is questionable. For example, in one study only patients who had return of spontaneous circulation (ROSC) before the arrival of the cardiac arrest team survived to leave hospital. In some hospitals the role of the cardiac arrest team has been incorporated into that of the medical emergency team (MET). The MET responds not only to cardiac arrests, but also to patients with acute physiological deterioration. The MET usually comprises medical and nursing staff from intensive care and general medicine and responds to specific calling criteria.

### CONCLUSIONS

The results of research into the benefits of introducing a MET are variable, although evidence for their benefit is increasing. Studies with historical control groups show a reduction in cardiac arrests, deaths and unanticipated intensive care unit admissions, improved detection of medical errors, treatment-limitation decisions, and reduced postoperative ward deaths. A cluster randomised controlled trial of the MET system was unable to demonstrate a reduction in the incidence of cardiac arrest, unexpected death, or unplanned ICU admission.

### REFERENCES

1. Nolan JP, Hazinski MF, Aicken R, et al. Part I. Executive Summary: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. *Resuscitation* 2015; 95: e1–e32.
2. Soar J, Callaway CW, Aibiki M, et al. Part 4: Advanced life support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Resuscitation* 2015; 95: e71–e122.
3. Nolan J, Soar J, Eikeland H. The chain of survival. *Resuscitation* 2006; 71: 270–1.
4. Soar J, Nolan JP, Bottiger BW, et al. European Resuscitation Council Guidelines for Resuscitation 2015 Section 3 Adult Advanced Life Support. *Resuscitation* 2015; 95: 99–146.

5. Excellence NifHaC. NICE clinical guideline 50 Acutely ill patients in hospital: recognition of and response to acute illness in adults in hospital. London: National Institute for Health and Clinical Excellence; 2007.
6. British Medical Association the Resuscitation Council (UK) and the Royal College of Nursing. Decisions relating to cardiopulmonary resuscitation. A joint statement from the British Medical Association, the Resuscitation Council (UK) and the Royal College of Nursing. London: British Medical Association; 2014.