

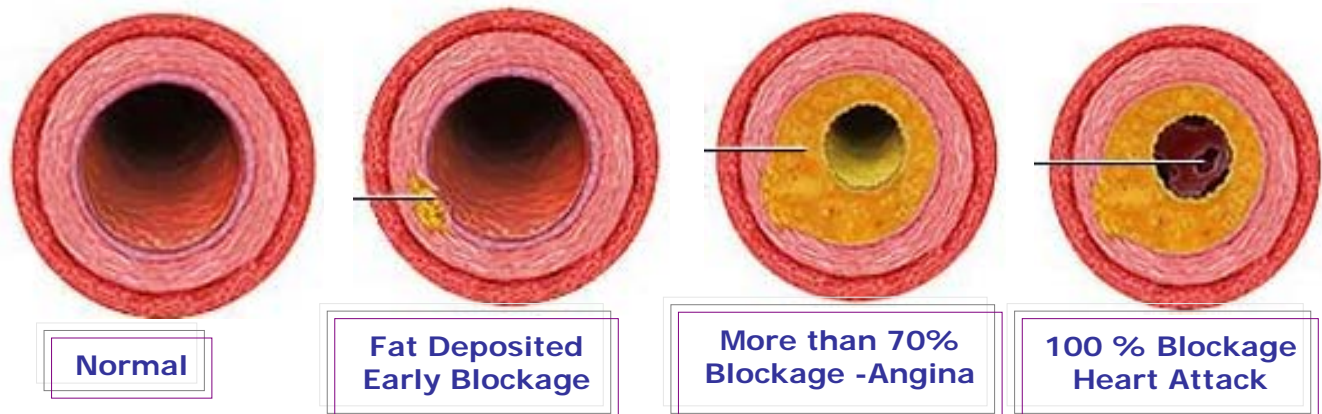
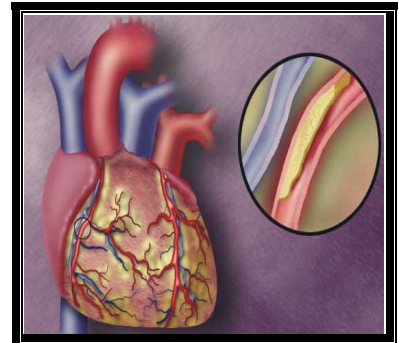
## What is Coronary Artery Disease? [CAD]

### [Atherosclerosis ]

The inside walls of the arteries are normally smooth and flexible, allowing blood to flow through them easily. Starting from young age, over the years, the inside of an artery's wall may become plugged up with deposits of fat and cholesterol. This process is known as **atherosclerosis**.

As the fatty deposits, known as plaques, continue to build up, they narrow the arteries and slow down the flow of blood and not enough oxygen-rich blood reaches the heart muscle.

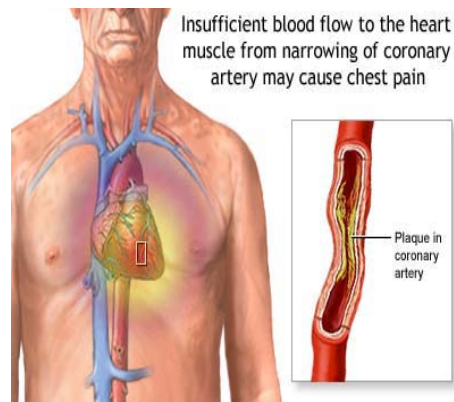
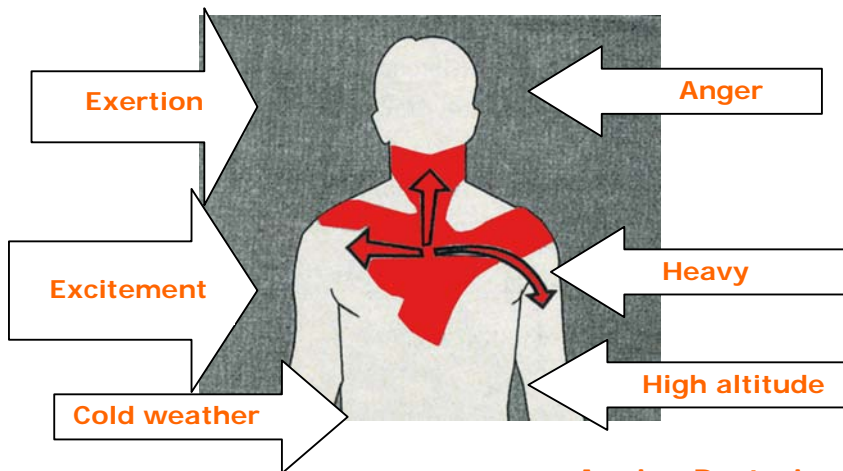
This process may at times increase alarmingly during stressful times and when risk factors like cholesterol, diabetes, or high blood pressure are not well controlled. This may lead to symptoms of angina or may result in a heart attack. Angina typically occurs during physical exertion or emotional stress, when the heart works harder and needs more oxygen. In some patients, angina is caused by **spasm**, a temporary contraction (tightening) of a segment of the artery's wall. During spasm, the coronary artery becomes narrowed and the flow of blood to the heart muscle is reduced. Spasm can occur in arteries with or without coronary disease and even at rest.



Coronary Artery Disease starts early age of 20-year progress later. No signs & symptoms until 80 % block

## What Is Angina?

Angina is a temporary pain or discomfort in the chest. It happens when the flow of blood to the heart muscle is temporarily reduced because of clogged or narrowed arteries. Angina is the result of a slow process, called **atherosclerosis**, in which fatty deposits build up inside the arteries. **Angina is a warning symptom.** It is a signal that the heart muscle is not getting enough oxygen.



### **Angina Pectoris** **[Chest Pain Due to Ischemia of The Heart Muscle]**

## Symptoms of Angina

Most people do not develop any symptoms until the blockages become more than 70% or more. Thereafter the anginal symptoms start occurring, especially during physical or mental exertion. People experience angina differently. Most describe their discomfort as pressure, tightness, heaviness, or squeezing in the chest, behind the breastbone. Some describe their angina as a burning sensation or "heartburn". Still others report excessive shortness of breath when they exert themselves. The pain or discomfort may spread from the chest to other areas, especially the arms (most commonly the left). It can also spread to the shoulders, upper back, neck, or jaw. Sometimes, the discomfort is felt in one or more of these areas, without any discomfort in the chest.

### Symptoms Of Angina

[Usually on exertion- physical or emotional]

- ✓ Pain in center of the chest
- ✓ Heaviness
- ✓ Sweating, Gabbhraman, Nausea, Vomiting
- ✓ Shortness of Breath, Unusual Weakness
- ✓ Pain May Spread to Left Arm, Neck, Back
- ✓ Indigestion / Gas Like Stomach Pain
- ✓ Symptoms Provoked By Exertion / Stress and relieved by rest / medicines

## Change In Your Angina Symptoms – A Warning Sign

In most patients, angina has a "stable" pattern – symptoms remain more or less the same over a long period of time, usually months or years. In some patients, however, the pattern of their angina becomes "unstable" – symptoms change, usually over a period of days or hours. For example, symptoms may become more frequent or may occur with less activity than usual. Or, symptoms may develop at rest or with minimal activities such as driving, eating, watching television, etc.

**This type of angina, called unstable angina, is a serious condition.** It generally indicates that there may be severe blockage(s) in the coronary arteries. It may even be a sign that a heart attack is likely to occur soon.

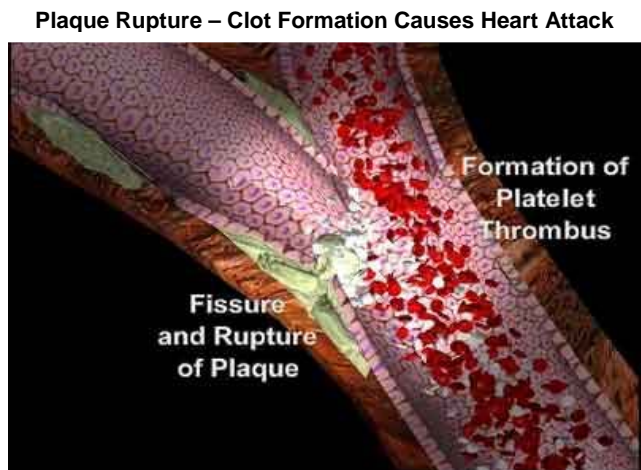
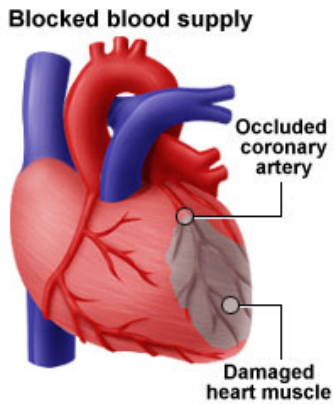
**Call your doctor** if you notice a significant change in "your" angina

- The pain or discomfort is more severe than usual
- It lasts for longer periods of time
- It occurs more and more frequently
- It is brought on by less and less activity, or while resting
- It is not helped with the usual dose of nitroglycerin.



## Heart Attack – [Myocardial Infarction]

[HEART muscle damage caused by complete obstruction]



### Symptoms Of Heart Attack

- ✓ Pain in center of the chest / Heaviness
- ✓ Sweating, Giddiness, Nausea, Vomiting
- ✓ Shortness of Breath, Unusual Weakness
- ✓ Pain May Spread to Left Arm, Neck, Back
- ✓ Indigestion / Gas Like Stomach Pain
- ✓ Symptoms Provoked By Exertion / Stress

#### Do you know?

Bypass or Balloon Angioplasty cannot eliminate the risk of heart attack because most heart attacks [85% or more] are caused by the plaque rupture at blockages less than 70 % which are not tackled by Bypass Surgery or Balloon Angioplasty. You must control your risk factors to prevent heart attack.

### Heart Attack Is An Emergency –What to do?

- ✓ Acute MI is an emergency condition. Contact your doctor or Cardio Uno staff immediately. The patient should be given rest and reassurance. Tablet aspirin 325 mg. and tablet Sorbitrate 5 mg. sublingually should be given if chest pain is not relieved. Sorbitrate can be repeated, if pain persists at 3-5 min. interval for 2- 3 times. Patient should be transferred in car or an ambulance to the well-equipped hospital where all facilities including ICCU and Angiography facilities are available.
- ✓ If the pain persists after initial medical management or if heart damage is more severe indicating serious outcome, patient may be subjected to emergency angiography/angioplasty. It usually takes about a week's time for the recovery before the patient is discharged from the hospital.
- ✓ For the long term well being and prevention of future complications all patients recovered from heart ailment must enroll in a well structured cardiac rehabilitation program.

### **CONTACT YOUR DOCTOR IMMEDIATELY OR**

**CONTACT CARDIO UNO EMERGENCY TEAM:**

**DR. SHAILESH DESAI: 98251 81245**

**DR. KAMLESH FATANIA: 98254 66788,**

**DESAI HOSPITAL: 2640 4039, 2646 3390**

## DIAGNOSIS OF CORONARY HEART DISEASE

Doctors often diagnose angina based on symptoms alone. Other times, the diagnosis is more difficult. Chest pain or discomfort can occur in a variety of other conditions. It is therefore important for doctors to distinguish between angina pain and chest pain from other sources. To diagnose the problem, your doctor will review your medical history and perform a number of diagnostic tests.

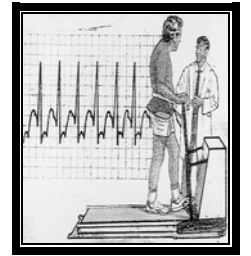
### ECG:

The Electrocardiogram is the most basic and the simplest test which helps in knowing many things about heart, like – whether the rhythm of heart is normal or not, which area of the heart is not receiving enough blood supply or is damaged, heart muscle wall thickness has increased or not [hypertrophy], etc.



### Exercise Stress Test

When an ECG taken while a person is resting usually does not show evidence of ischemia, an ECG taken during exercise, provides more information. This is one of the most important tests for heart patients and can help your doctor decide how severe your heart problem is and how much exercise /activity is safe for you.

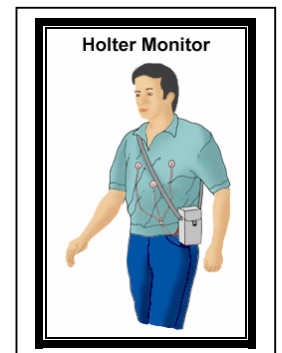


### Echo Cardiogram:

This test is a sonography test of the heart in which with the help of ultrasound waves image of the moving heart can be seen on the TV Screen. The area of the heart which has insufficient blood supply moves less well, the area which is damaged in previous heart attack does not move at all and thus this test gives information regarding ischemic and damaged areas of the heart. This test also can measure the pumping power (Ejection Fraction – EF) of the heart and condition of the valves of the heart.

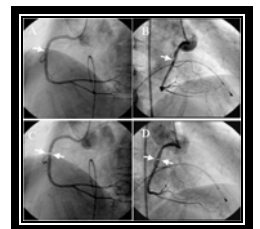
### Holter Monitor: (24 Hour Ambulatory ECG monitoring)

In this test a recorder (like a walkman) is applied to chest with ECG Electrodes. While the patient is doing his routine activities, this monitor continuously keeps on recording and analyzing the ECG and whatever abnormality occurs, is reported in the 24 - hours computerized ECG report. With this test ECG changes during chest pain episodes, episodes of silent ischemia and rhythm disturbances can be recorded and can be co-related with patient's symptoms.



### Coronary Angiography:

If the exercise stress test is abnormal your doctor may recommend coronary angiography. Cardiac catheterization is a procedure that involves the insertion of a catheter (a thin, flexible plastic tube) into the body, relatively safe procedure. Doctors inject dye through the catheter into the left ventricle (the heart's main pumping chamber) and into the coronary arteries. An x-ray camera then takes pictures. Cardiac catheterization provides important information about the presence (or absence) of coronary blockages.



## Learning To Live With Angina – Cardiac Rehabilitation Program

The great majority of patients who have angina are able to control their symptoms and lead a relatively normal and productive life. Based on how severe your condition is , your doctor will prescribe a treatment plan that's right for you. The medications and other treatments your doctor prescribes are only part of what needs to be done to control angina. It's also important that you help prevent further buildup of fatty deposits in your arteries, by controlling certain factors that brought on your condition in the first place.

You can control these factors by making certain changes in your lifestyle. For example, you can change your eating habits, quit smoking, control your blood pressure, and exercise regularly. Our **Cardio Uno** program and its expert team can help you to do these changes.

### Your Daily Activities:

- ✓ **Control the pace of your activities.** Angina occurs if you try to do too much at one time
- ✓ **Plan your day.** Allow yourself enough time so that you do not rush through any of your activities.
- ✓ **Slow down or stop when you feel tired.** Use good judgment and "listen" to your body. Alternate your activities with periods of rest.
- ✓ **When you go for a walk,** don't walk uphill, against a cold wind, or when the weather is hot and humid.
- ✓ **When you travel,** do it in a leisurely and relaxed fashion. Avoid carrying heavy luggage and suitcases. If necessary, get assistance or use a cart.
- ✓ **Avoid large meals and rich foods. Avoid extremes in weather.** Cold and windy weather can trigger angina and very hot and humid weather can tire you more quickly than usual. If you live in a hot, humid climate, take plenty of fluids during the day.

## Treating Angina – Medical Management

The way your doctor chooses to treat your angina depends on how severe your symptoms are, and how extensive the block-ages in your arteries are. If you have angina mild to moderate in severity, your doctor will most likely prescribe anti-anginal drugs (medications). Most patients do well with medicines. If your symptoms become disabling or if the diagnostic tests have shown “threatening” disease (that is, disease that could lead to a severe heart attack), he may recommend coronary angioplasty or bypass surgery.

### Anti – Anginal Drugs:

Anti-anginal drugs work either by improving the supply of oxygen to the heart, by reducing the heart’s need for oxygen, or by doing both. The three major groups of anti-anginal drugs are the nitrates, the beta blockers, and the calcium channel blockers.

#### a) Nitrates

Nitrates dilate blood vessels, lower blood pressure, and make it easier for the heart to work. They also improve the flow of blood to the heart muscle.

- ✓ Nitroglycerin (short-acting nitrates): works quickly, and is therefore used to relieve an angina attack, as needed.
- ✓ Long-acting nitrates: work more slowly, and are used to prevent angina attacks during the day-to-day activities.

#### How to use nitroglycerin:

- ✓ When you begin having angina, **stop the activity you are doing and rest.**
- ✓ If the pain does not go away with rest, **place a nitroglycerin tablet under the tongue.** Do not bite or chew the tablet. It is best to take nitroglycerin while you sit or lie down, otherwise you may get dizzy.
- ✓ **If angina continues**, take a second tablet 5 minutes after the first. If the pain or discomfort is not completely gone, take a third tablet 5 minutes later.
- ✓ **If angina continues after taking three nitroglycerin tablets**, or if it lasts for more than 15 minutes, you may be having a heart attack. Seek medical help immediately.

#### b) Beta Blockers

Beta-blockers block the action of certain nerve endings (called beta receptors) in the heart. They slow down the heart rate and make the heart beat less forcefully. As a result, beta-blockers reduce the workload on the heart and reduce its need for oxygen & hence reduce anginal attacks. Angina patients who take beta-blockers are able to exercise longer without getting symptoms. Beta-blockers are often used together with nitrates in the treatment of angina. Common side effects with beta-blockers include shortness of breath, wheezing, dizziness, and fatigue. Although some slowing of the heart rate is expected in most patients, too large a dose can cause severe slowing of the heart rate and symptoms of dizziness.

**Never stop taking beta-blockers suddenly and without your doctor’s knowledge.**

This could cause worsening of your angina and might even bring on a heart attack.

#### c) Calcium Channel Blockers

Calcium plays an important role in the contraction (tightening) of the smooth muscle cells in the wall of arteries. Calcium channel blockers block the passage of calcium into those muscle cells. By doing so, they relax the walls of coronary arteries, which widen, allowing blood to flow through them more easily. Calcium channel blockers can be used either alone or with other anti-anginal medications. The calcium channel blockers each have somewhat different side effects. Common ones include headache, dizziness, low blood pressure, slow heartbeat, leg swelling (mostly with nifedipine), and constipation (with verapamil).

### Aspirin the master drug

Your doctor may advise you to take an aspirin tablet daily. Studies have shown that taking aspirin can help reduce the risk of a heart attack in patients with known coronary disease. Aspirin works by keeping the platelets from sticking to the walls of arteries and to each other (the platelets are tiny blood cells that take part in the clotting of blood). This way, aspirin reduces the tendency for blood clots to form in the arteries and can help prevent a heart attack.

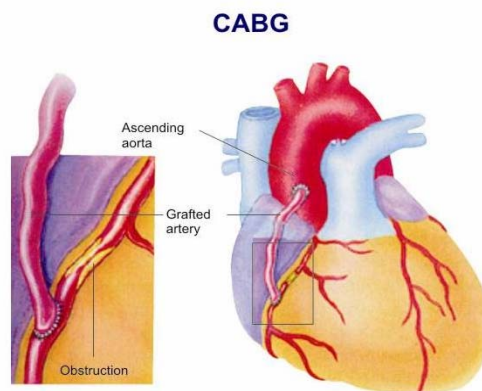
## Coronary Angioplasty:



Coronary Angioplasty is a technique used to widen the passageway in a narrowed coronary artery. A special catheter is introduced with a tiny balloon at its tip into the narrowed coronary artery which is opened up by inflating the balloon.

Coronary angioplasty works best with patients who have only one or two arteries that are severely narrowed and also when heart attack has begun.

## Bypass Surgery:



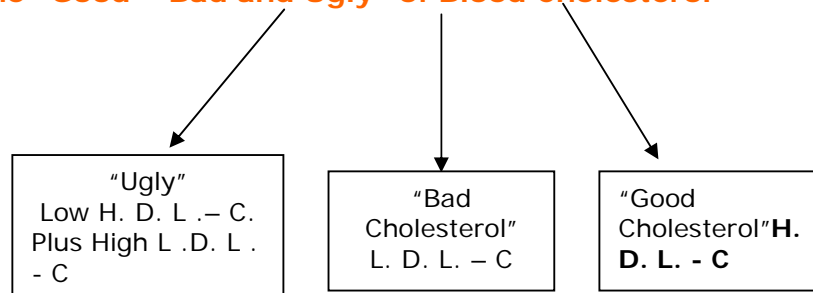
Bypass surgery is an operation in which surgeons create a detour ('bypass') to allow blood to go around blockages in the coronary arteries by using either a segment of vein from the leg or an artery from inside the chest. With the graft in place, blood can flow freely to the heart muscle.

Bypass surgery or balloon angioplasty may be advised when angina becomes disabling; when medications fail to relieve symptoms; or when the left main coronary artery [LMCA] or all three major vessels are severely blocked in their initial portions [severe proximal triple vessel disease].

## HIGH BLOOD CHOLESTEROL

Cholesterol is a fat-like substance circulating in our blood. It is also present in every cell of our body. Some cholesterol is necessary for the synthesis of our cell membranes and hormones and for the normal functioning of our body. Our liver produces enough cholesterol needed for the body. Additional amount of cholesterol is obtained from the fatty foods we eat, and this may be more than what is necessary. **While some cholesterol is necessary for the body, too much of it is harmful. Excess cholesterol gets deposited on the inner walls of our arteries**, especially those of heart and brains and over a period of years progressively narrows and eventually blocks these arteries. This process is called atherosclerosis and it can lead to heart attack and / or stroke. An excessive level of cholesterol in blood is considered to be one of the most leading causes of heart disease. Hence, controlling blood levels of cholesterol by diet control, exercise and if necessary, be cholesterol-reducing medicines is extremely important to prevent progression of heart disease and to reduce risk of future heart attack.

### Types of Blood Cholesterol The "Good – Bad and Ugly" of Blood Cholesterol



There are different kinds of lipids [cholesterol] and fats having different effects in our blood. The most known are – L. D. L. [Low Density Lipoprotein] Cholesterol, H. D. L. [High Density Lipoproteins] Cholesterol, Triglycerides, V.L.D.L. Cholesterol and total cholesterol. New types of lipids are being discovered having causative effect on heart disease like apolipoprotein A & B.

### Causes of high Blood Cholesterol:

Your blood cholesterol can be influenced by many factors. These are:

#### **1. Diet / food rich in fats and calories:**

Foods like sweets, 'farsan', fried foods, meat, eggs, ice creams, pizzas and foods containing butter, oil, ghee, or excess calories etc. can raise your blood cholesterol, especially the 'bad cholesterol' or the L.D.L. cholesterol.

#### **2. Overweight:**

Being overweight can raise your L.D.L. or the 'bad cholesterol' and can lower your H.D.L. or the 'good cholesterol', People having upper body and abdominal obesity are especially at high risk of developing heart disease.

#### **3. Lack of exercise:**

Sedentary people tend to have high levels of L.D.L. and low levels of H.D.L. cholesterol. They also tend to be overweight and may have high blood sugar levels.

#### **4. Smoking:**



Smoking and tobacco can raise L.D.L. cholesterol and reduce H.D.L. cholesterol in the blood.

#### **5. Excessive Stress:**

Stress can increase L.D.L. levels and decrease H.D.L. levels in the blood. Stress can also lead to overeating, lack of exercise that eventually leads to high cholesterol and obesity.

#### **6. Heredity:**

Genes also play important role in how the body makes and handles cholesterol. Persons having hereditary tendency for high blood cholesterol have an imbalance between the production of cholesterol in liver and disposal of cholesterol by the body due to some enzymes deficiency.

### **Get Your Blood Cholesterol Checked:**

All adults should have their blood cholesterol (Lipid Profile) checked at least once in 2 to 3 years. All heart patients should get their blood cholesterol checked at least once in a year. (Those having high blood cholesterol should get them checked every 4-6 month.

Overnight fasting is necessary when complete lipid profile is tested but it is not necessary when only total cholesterol and H.D.L. cholesterol are checked.

Following are the desirable, average and high levels for different types of blood cholesterol.

	<b>Desirable</b>	<b>Average Risk</b>	<b>High Risk</b>
L.D.L. cholesterol	<100	100 – 130	>130
H.D.L. cholesterol	>45	045 – 035	<035
Triglycerides	<150	150 – 250	>250
Total cholesterol	<150	150 – 200	>200

- ❑ Indians as a race are genetically prone to develop more severe heart disease at earlier age, and hence for them desirable values for blood cholesterol are much lower than Europeans and Americans
- ❑ Even apparently normal cholesterol levels can become harmful if your H.D.L. levels are below 35

Isolated high triglycerides (with normal cholesterol) though not so harmful, also need to be reduced.

### **Ways to reduce Blood Cholesterol:**

**Remember:** Each 1% reduction in your blood cholesterol can reduce your risk for heart disease by about 2%

1. Avoid foods rich in fats and saturated fats: [Meat, Eggs, Ghee, Oil, Sweets. etc.]
2. **Increase the usage of foods like green leafy vegetables, fruits and whole grains.**
3. Be physically active and exercise regularly:  
Regular exercise will help you increase your good cholesterol – the H.D.L. cholesterol and to reduce your bad cholesterol – L.D.L.

cholesterol. Regular exercise will also help you to reduce your weight, body fat, your blood pressure and your stress levels.

4. Cut down calories and fat in your diet and increase your physical activities. Consult a dietitian, if needed.

### LIMITING FAT IN DIET:

- ❑ Fat has more than twice the calories of protein or carbohydrate.
- ❑ Calories from fat turn in to fat on your body more easily than calories from other sources.
- ❑ High fat foods trigger excessive eating in some people. Especially if those high fat foods are also sweet, like ice-cream, cookies and chocolate.

High blood cholesterol can be more harmful if you also have any of the following 'risk factors for heart disease':

- |                       |   |
|-----------------------|---|
| ❑ Smoking / Tobacco   | ❑ Excessive stress                          |
| ❑ Diabetes            | ❑ Lack of exercise                          |
| ❑ High blood pressure | ❑ Low H.D.L. and or high L.D.L. cholesterol |
| ❑ Overweight          | ❑ Family history of heart disease           |
| ❑ Age above 40 years  |   |

**Remember: With increasing number of risk factors, your risk increases in multiplications.**

# Obesity

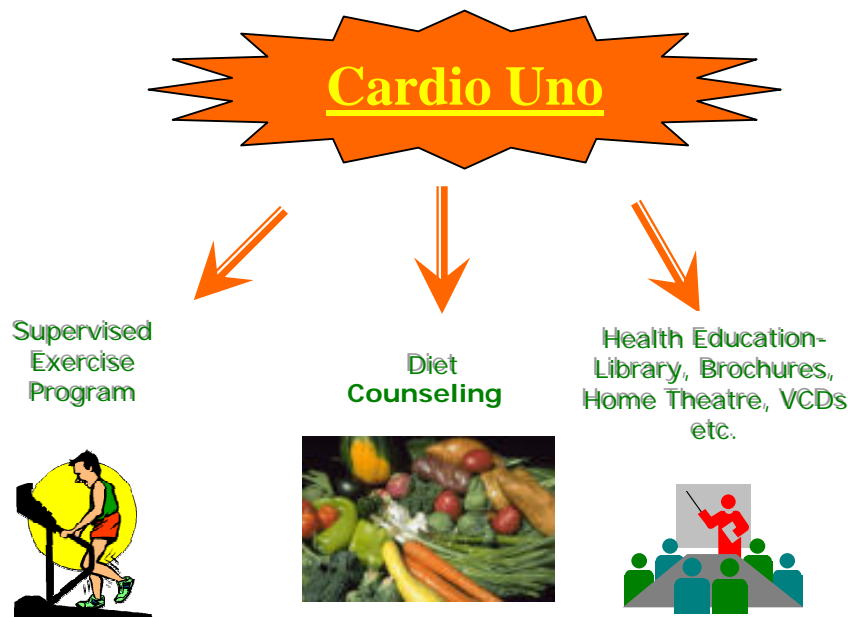
## Health Risks of Obesity:

- 80% of type II diabetes relate to obesity.
- 70% of cardiovascular disease related to obesity.
- 42% breast and colon cancer diagnosed among obese individuals.
- 30% of gall bladder surgery related to obesity.
- 26% of obese people having high blood pressure.
- Almost all obese persons eventually develop arthritis of knees.
- Obesity reduces average life span by 8.2 years.
- Each year an estimated 300,000 Americans die prematurely of caused by obesity. Indian figures could be 4-5 times higher.
- Anxiety, depression, frustration etc are more commonly seen in obese persons.
- 30 – 55 % increase in overall health care cost

## Why loose weight?

- Reducing chance of developing heart disease by 20-30%.
- Improving in blood pressure, and levels of blood sugar, blood cholesterol and triglycerides.
- The life span increases by 3-4 months for every kilogram of weight lost.

## Join Cardio Uno to control your weight



# Diabetes

## Health Risks of Diabetes:

### Heart Disease:

- 3-5 times higher risk for heart disease
- Diffuse, multi-vessel coronary artery disease
- High risk of recurrence after Bypass / angioplasty

### Stroke:

- 2-3 times higher risk for paralysis
- Much higher risk if blood pressure is high
- Kidney Disease – 17 times higher risk for kidney damage

- High risk of kidney failure (C.R.F.)
- Eye - Retinopathy – 17 times higher risk:
  - Early cataract, retinopathy or glaucoma lead to permanent vision loss
- Foot gangrene - Neuropathy – 25 times higher risk
  - Peripheral neuropathy causing numbness & burning in hands- feet
  - Minor injury / infection can progress to foot gangrene

**Ideal goals are:**  
[Blood test every 2 months]  
FBS < 110 PPBS < 140  
HbA1c < 7 %

Join Cardio Uno to control your Diabetes

## Cardio Uno

Supervised  
Exercise  
Program



Diet  
Counseling



Health Education-  
Library, Brochures,  
Home Theatre, VCDs  
etc.



# High Blood Pressure

## Health Risks of High Blood Pressure:

- ★ **Atherosclerosis [Stiffening & clogging of arteries]**
- ★ **Angina, Heart Attack**
- ★ **Stroke [Paralysis]**
- ★ **Pumping Failure Of The Heart**
- ★ **Kidney Failure & Vision Loss**

## How to control your High Blood Pressure?

- ★ **Take low salt diet - Avoid papad, achar, fast food**
- ★ **Reduce Stress, practice yoga or meditation**
- ★ **Reduce weight & Exercise regularly**
- ★ **Stop Smoking / Tobacco**
- ★ **Take medicines regularly.**
- ★ **Don't stop medicines without consulting your doctor**
- ★ **Check B.P. every 15 days with Family Doctor & every 2 – 3 months with cardiologist**

**Ideal B.P. = < 130 / 85 mmHg.**

**Join Cardio Uno to control your High Blood Pressure**

**Cardio Uno**

Supervised  
Exercise  
Program



Diet  
Counseling



Health Education-  
Library, Brochures,  
Home Theatre, VCDs  
etc.



# High Blood Cholesterol

## Health Risks of High Blood Cholesterol:

- ★ Atherosclerosis [Stiffening & clogging of arteries]
- ★ Angina, Heart Attack
- ★ Stroke [Paralysis]
- ★ **Kidney Failure**
- ★ **Peripheral Arterial Disease**

## How to control your High Blood Cholesterol?

- ★ Reduce fat in your diet (Ghee, oil, sweets, ice-cream)
- ★ Exercise 30-50 min. daily
- ★ Reduced your weight by low calorie diet
- ★ Check lipid profile every 4-6 months
- ★ Take cholesterol reducing medicines, if advised

**Ideal cholesterol levels**  
Total cholesterol < 160, LDL [worst] < 100,  
Good: HDL > 45

**Join Cardio Uno to control your  
High Blood Cholesterol**

**Cardio Uno**

Supervise  
d Exercise  
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