



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

BMST4004

Cardiac Conditions

Trawsnewid Addysg; Trawsnewid Bywydau
Transforming Education; Transforming Lives



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Learning Outcomes

- Describe benefits of physical activity in CV conditions
- Understand and explain potential strategies to minimise risk of CHD
- Describe CIs of physical activity in Cardiac conditions
- Discuss prevalent CV conditions including aetiology and epidemiology



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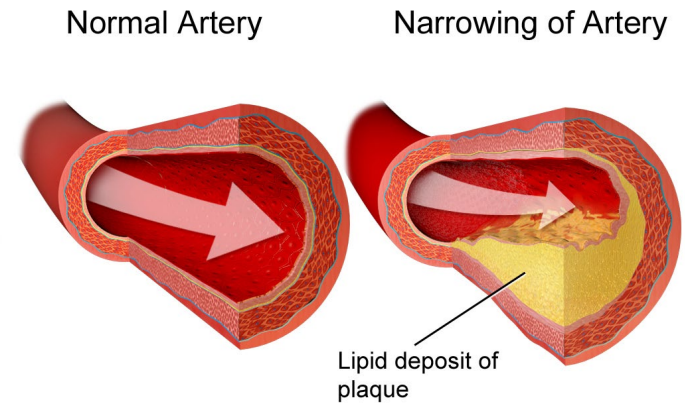
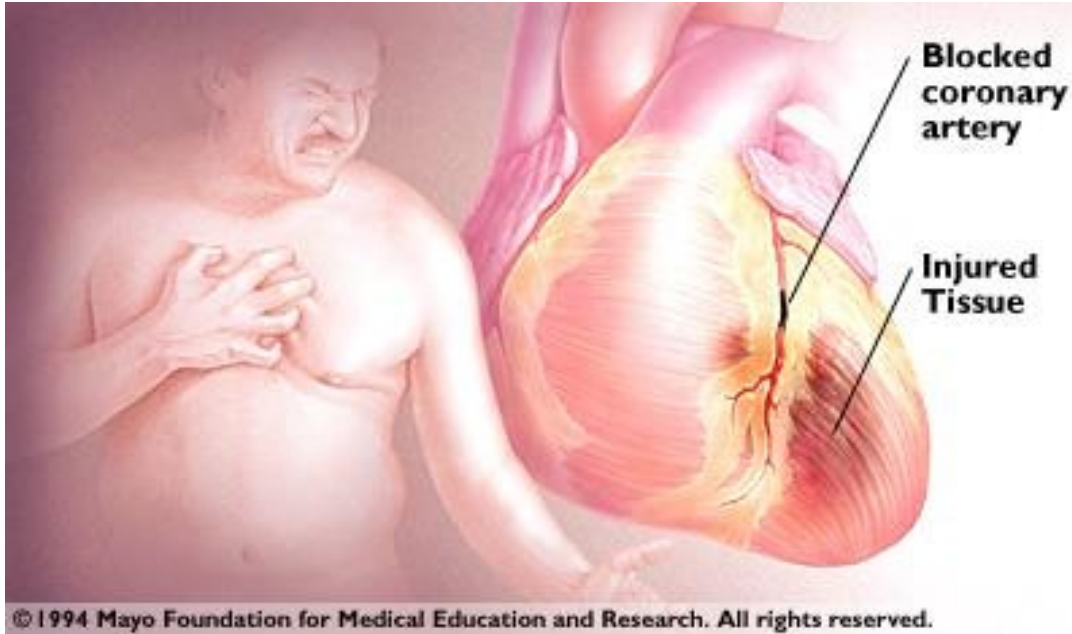
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Heart Disease The Silent Killer

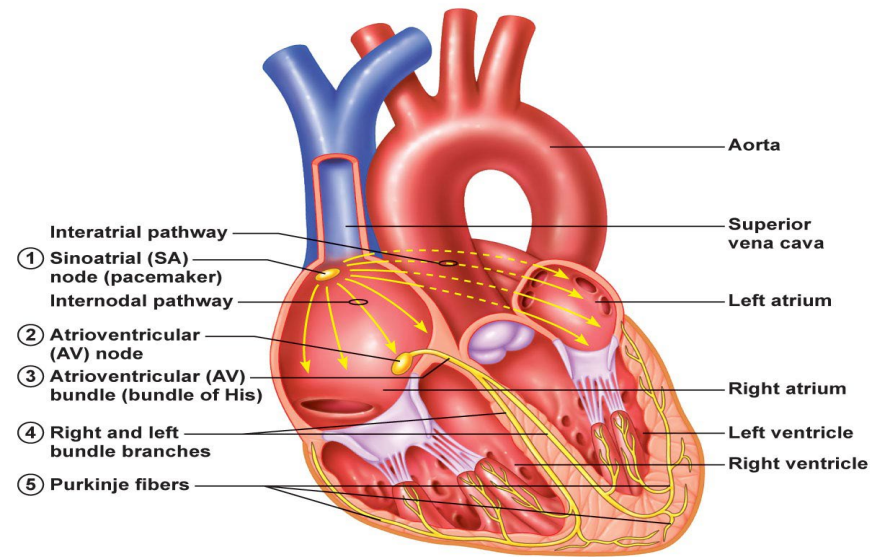


Coronary Artery Disease

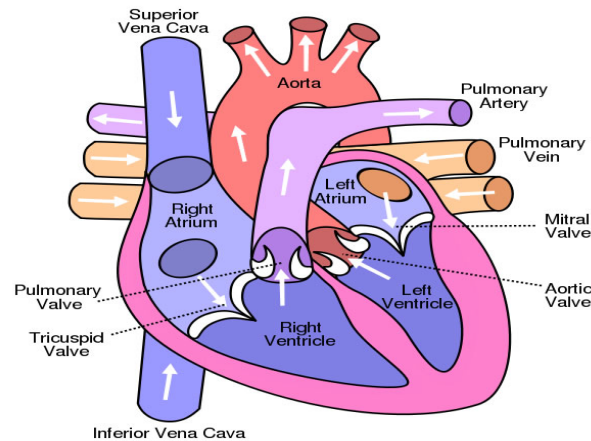
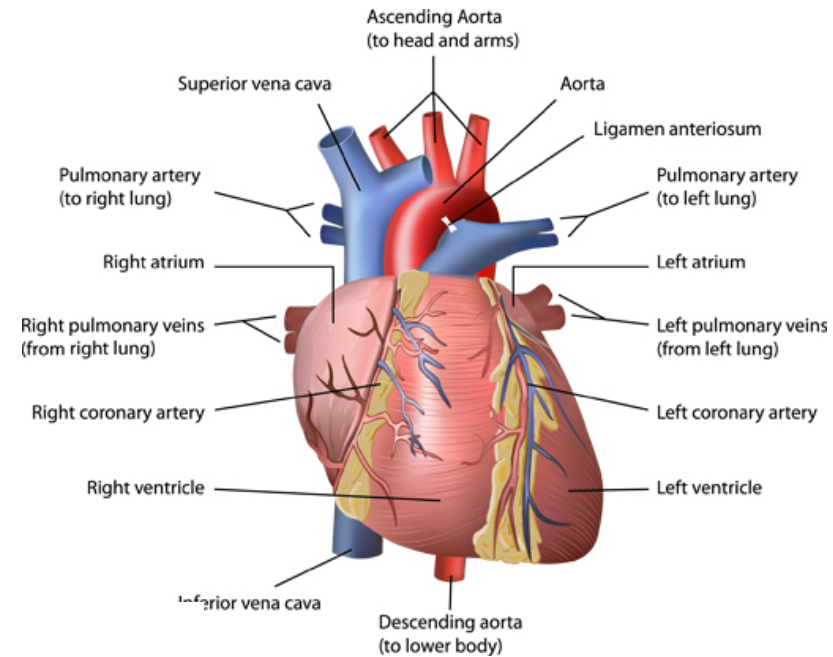
What is Heart Disease?

- A general term that covers a number of diseases which affect the heart, including;
 - coronary artery disease,
 - heart-failure,
 - angina.
 - Many More

The Heart



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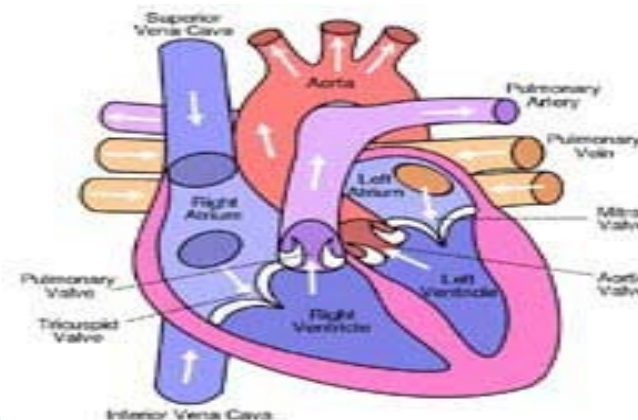
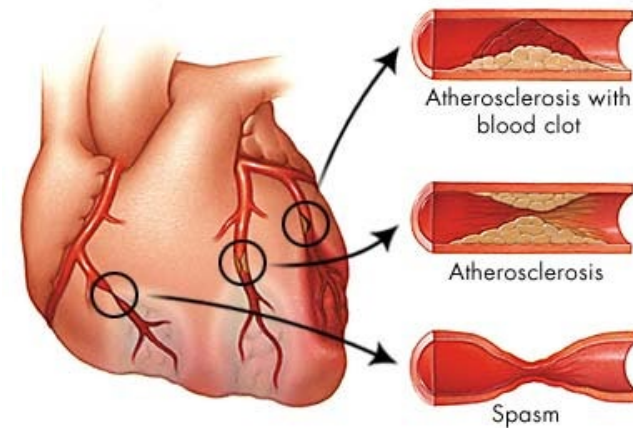


Coronary Heart Disease (CHD)

- **Is often preventable** yet kills more than 73,000 people and 110,000 people have a heart attack in England every year.
- around 2 million people suffer from angina in the UK.
- is the number one killer in the UK.
 - 1 in 6 men
 - 1 in 10 women
- costs the National Health Service in the UK approx £15 billion annually.

Coronary Artery Disease

- Atherosclerosis
fatty deposits of
cholesterol
- Hypertension Elevated
diastolic blood pressure
 $\geq 90\text{mmHg}$.



Coronary Artery Disease

Occurs when the coronary arteries that supply the heart muscle become blocked.

- Partially blocked it causes angina.
- Fully blocked it causes a myocardial infarction or a heart attack

Categories of MI

- **Transmural** - atherosclerosis of the major coronary arteries sub-classified into anterior, posterior, or inferior. They extend through the whole thickness of the heart muscle and are usually a result of complete occlusion of the area's blood supply.
- **Subendocardial**: involve a small area in the subendocardial wall of the left ventricle, ventricular septum, or papillary muscles. Result due locally decreased blood supply, possibly from a narrowing of the coronary arteries.

Myocardial Infarction or Heart Attack

Symptoms:

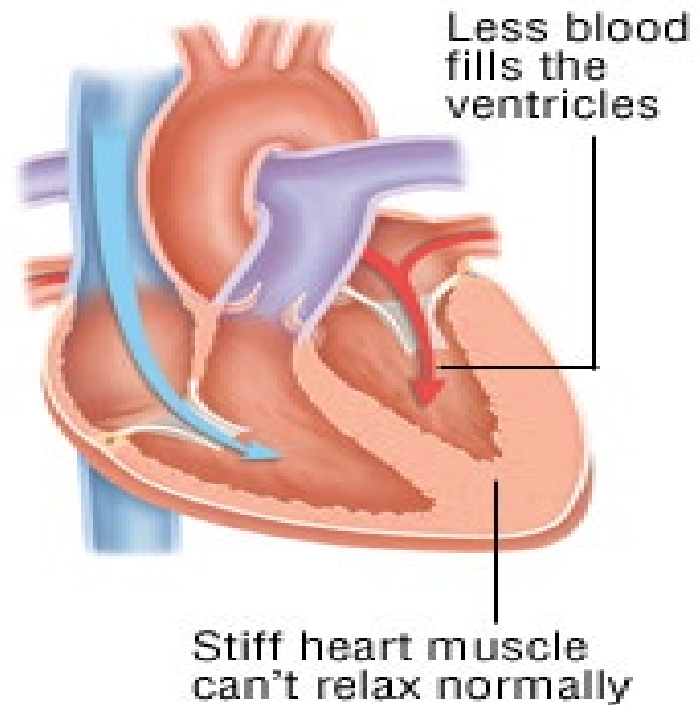
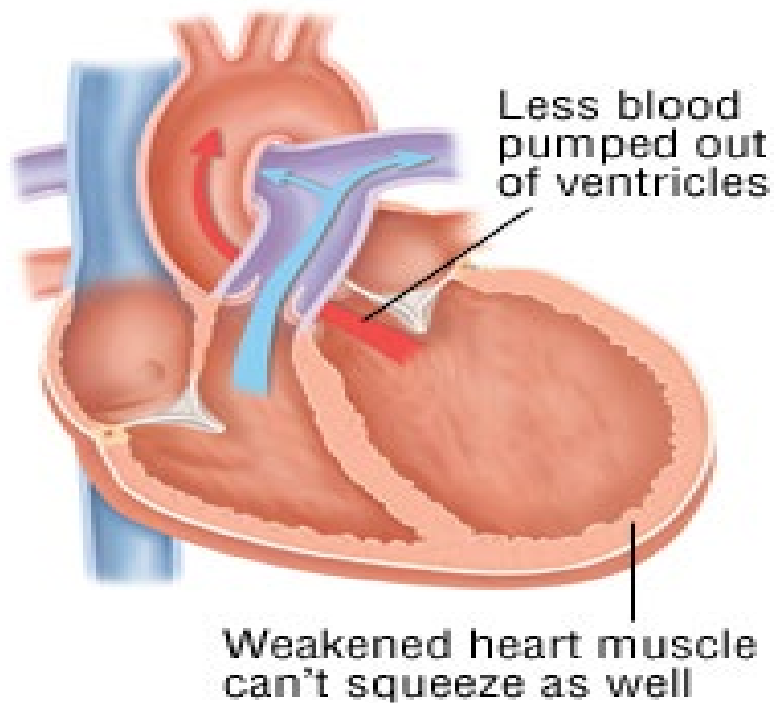
- uncomfortable pressure, fullness, squeezing pain, pain spreading to the shoulders, neck and arms.
- Chest discomfort and light headedness
- Anxiety/nervousness
- Paleness or pallor
- Increased irregular heart rate
- Feeling of impending doom

Congestive Heart Failure

Functional cardiac disorder that impairs the ability of the heart to fill with or pump a sufficient amount of blood through the body

- Does not mean the heart has failed, simply means the heart is not doing an efficient job.
- May results from an injury or a reduction of function of the heart muscle.
- Can be due to arteriosclerosis, hypertension, myocardial infarction, rheumatic fever or birth defect.

Congestive Heart Failure



Congestive Heart Failure

The right side of the heart collects the blood returning from the body and sends it to the lungs.

- If it is failing, the blood backs up into the veins (edema).

The left side of the heart receives the blood from the lungs and pumps it out into the body.

- If it is failing the blood is not pumped effectively.

Risk Factors Associated with CHD

Unchangeable;

- Age- the older you get, the greater the chance.
- Sex- males have a greater rate even after women pass menopause.
- Race- minorities (Asian & Caribbean) have a greater chance.
- Family history- if family members have had CHD, there is a greater chance.
- Personal Medical History- other diseases such as Diabetes Mellitus can increase chances.

Risk Factors Associated with CHD

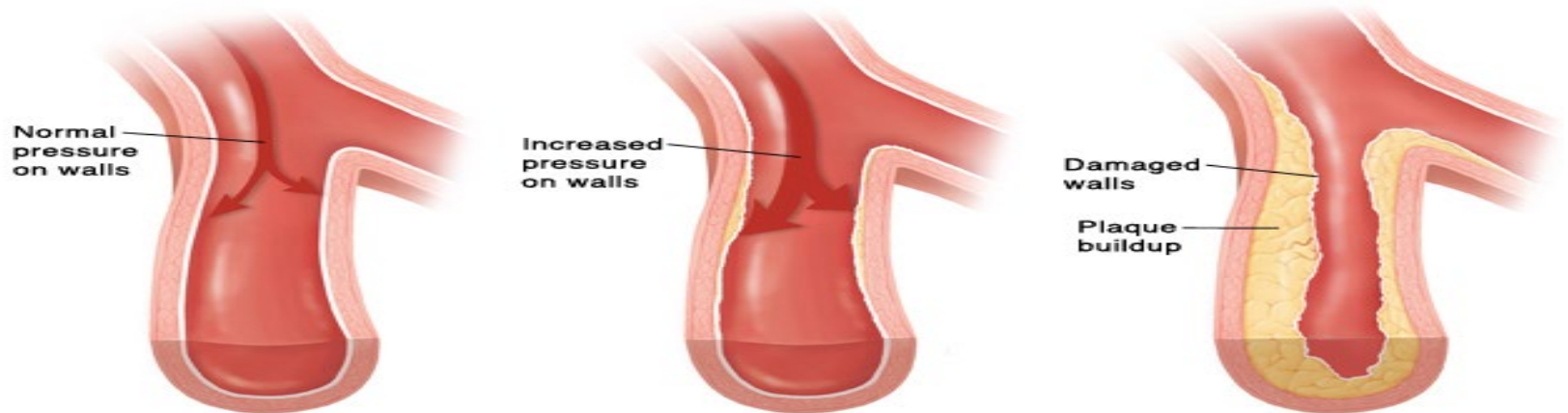
Changeable;

- Hypertension
- Serum cholesterol
- Obesity
- Diabetes Mellitus
- Physical Inactivity
- Cigarette Smoking
- Alcohol Intake

Hypertension

Blood pressure is the force created when the heart pumps blood.

When blood pressure is high the heart has to pump harder and the arteries are under increased pressure, which can lead to injury of the artery walls, atherosclerosis, and coronary heart disease.



Hypertension Categories

Hypertension Stages		
<i>Category</i>	<i>Systolic (mmHg)</i>	<i>Diastolic (mmHg)</i>
Optimal blood pressure	< 120	< 80
Normal blood pressure	< 130	< 85
Prehypertension	130 to 139	85 to 89
Grade 1 hypertension (mild)	140 to 159	90 to 99
Grade 2 hypertension (moderate)	160 to 179	100 to 109
Grade 3 hypertension (severe)	> 180	> 110
Isolated systolic hypertension (Grade 1)	140 to 159	< 90
Isolated systolic hypertension (Grade 2)	> 160	< 90

Cholesterol

LDL and VLDL can increase the build-up of cholesterol in artery walls, causing atherosclerosis. These are considered the "bad" or unhealthy cholesterol, and high levels increases the risk of CHD.

HDL, on the other hand, helps remove cholesterol from the blood and helps prevent cholesterol build-up in the arteries.

Obesity

- People who are obese have 2 to 6 times the risk of developing hypertension.
- Location of the body fat is significant.

Pears – Women

Apples – Men

Diabetes Mellitus

- At any given cholesterol level, diabetic persons have a 2 or 3 x higher risk of atherosclerosis
- About 2/3 of the people with diabetes die of some type of heart or blood vessel disease.

Because

- Insulin is required to maintain adequate levels of **lipoprotein lipase**, an enzyme needed to break down bad cholesterol.

Physical Inactivity

- Increasing physical activity has been shown to decrease blood pressure.
- Moderate to intense physical activity for 30-45 minutes on most days of the week is recommended.

Cigarette Smoking

- Causes an increase in blood pressure
- Smokers usually have lower levels of HDL
- The chemicals in tobacco smoke increase the build-up of plaque in artery walls and promote the development of blood clots that can cause heart attacks
- Within 1 year of quitting, CHD risk decreases, within 2 years it reaches the level of a nonsmoker.

Alcohol Consumption

- In small amounts it acts as a vasodilator-Good! 1-2 drinks.
- In large amounts it acts as a vasoconstrictor-BAD! 3-4 drinks

Treatment Of CHD

To determine location of flow restriction

Cardiac Catheterization - a tube is inserted into an artery or vein and dye injected.

Also a good method to determine the amount of blood and oxygen the heart is receiving.

Treatment of CHD

- Coronary Artery Bypass Surgery

The most frequently performed major surgery in the United States. Surgery reroutes or bypasses blood around clogged arteries.

Treatment

- Angioplasty (PCTA)

It involves creating a space in a blocked artery by inserting a small balloon and then inflating it. Then a mesh stent is placed to help maintain the space.

Diet and Prevention of CVD

- Eat a variety of fruits and vegetables every day. (5 servings - they are naturally low in fat and high in vitamins and minerals)
- Eat a variety of grain products (6 a day)
- Choose nonfat or low-fat products.
- Use lean meats- choose chicken, fish, turkey and lean cuts of beef and pork.
- Switch to fat-free milk- gradually reduce the fat content of the milk you drink.

Dietary Guidelines

- Choose fats with 2 gms or less of saturated fats per serving such as liquid and tub margarines, canola oil and olive oil.
- Balance the number of calories you eat with the number of calories you use each day.
- Maintain a level of physical activity that keeps you fit and matches the number of calories you eat.

Dietary Guidelines

- Limit your intake of foods high in calories and low in nutrition.
- Limit foods high in saturated fat, trans fat and cholesterol.
- Eat less than 6 g of salt a day.
- Have no more than one alcoholic drink a day.



Step I and II Diets

To treat high blood pressure and hypercholesterolemia and are designed to lower LDL levels, while at the same time promoting good nutrition.

	Step I	Step II
1. Total fat	30% or less	30% or less
2. Sat fat	7-10%	7%
3. Poly fat	up to 10%	up to 10%
4. Mono fat	Up to 15%	up to 15%
5. Carb	55% or more	55% or more
6. Pro	Approx 15%	Approx 15%
7. Chol.	Less than 300mg	less than 200 mg

Exercise and CVD

Good in preventing and treating those at high risk;

1. Reduces incidence of obesity.
2. Increases HDL
3. Lowers LDL and total cholesterol
4. Helps control diabetes and hypertension
5. Those at high risk should take part in a specially supervised program.

Phases of the Cardiac Rehabilitation Program

The Cardiac Rehabilitation Program consists of 4 phases. The phase at which each patient enters the program depends on;

- state of recovery,
- current state of health,
- current activity level,
- past experience with lifestyle counselling and/or exercise.

Phase I

Patients are still in the hospital after the diagnosis of a heart problem.

The physician usually provides a referral to the Cardiac Rehabilitation Program at that time, who review the diagnosis,

Discuss & Advice on medications, diet and activity level after discharge.

Phase II

- Patients within two to four weeks after recovering from a heart attack or heart surgery.
- Cardiac rehabilitation centres on preventing weakening muscles as the heart begins to heal (evaluation of the medical condition of each individual patient).
- Treatment during this period includes a low-level exercise tolerance test with a cardiologist in order to establish a customised exercise schedule, and low-intensity aerobic exercise for short periods of time, progressively working up to 30 minutes of continuous, leisurely exercise.

Phase III

Patients change to the role of **participants** in their care by learning how to reduce their risk for further heart disease events.

Participants enter group education, counselling and exercise training sessions which build upon learning new skills in caring for themselves. Participants learn to identify and better control lifestyle factors such as stress, diabetes, body weight, cholesterol levels, blood pressure, smoking and heart symptoms.

Participants also learn how to further strengthen the heart muscle with regular aerobic exercise and how to strengthen other muscles in the body with light-weight training (when it is safe and appropriate).

Phase IV

After reaching the goals in Phase III, participants may elect to enter Phase IV to maintain the learned “Heart Healthy” behaviours by exercising with others who have integrated healthy changes into everyday life.

Treatment during this period includes supervised monitored exercise by trained professionals who will continue to advance their aerobic exercise and strength training capabilities; monitor their vital signs, cholesterol levels and serve as a resource for heart health needs

Conclusion

- Cardiovascular disease is the number one killer.
- It is highly preventable and controllable with diet and exercise.