

I.T.I. "A. MALIGNANI" UDINE

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Classi: Seconda Biennio Istituto Tecnico Durata: 4 ore

Docenti: Prof.sse Acchiardi Chiara e Boasso Annamaria

THE HEART

First lesson

Objectives

- Learn about heart
- Listen for specific information
- Read for detailed information
- Use scientific terms

Glossary

Pericardium

Atrium

Ventricle

Valve

Diastole

Systole

Pacemaker

Coronary arteries

Vena cava

Pulmonary veins and arteries

Heart attack

The double pump

Your heart is nearly all muscle. It is the pump that circulates blood around your body.

Your heart beats about 70 times per minute - for a lifetime.

The heart is enclosed in a membrane called pericardium.

Your heart is really two pumps side by side. The right side of your heart is one pump.

The left side of your heart is another pump. Each side is kept completely separate.

This way the deoxygenated blood on the right side does not mix with the oxygenated blood on the left side.

On each side of the heart there are two chambers.

The upper chambers are called atria (singular atrium). Blood empties into them from veins. When the atria contract they pump blood into the lower chambers.

The lower chambers are called ventricles. These have much more muscular walls. When the ventricle contract they pump the blood out into arteries.

Between each atrium and ventricle is a valve.

The valve prevents the blood flowing back into the atrium when the ventricle contracts. The bicuspid valve prevents back flow into the left atrium; the tricuspid valve prevents back flow into the right atrium.

Heart action

The heart pumps blood when its muscle contracts. When the muscle contracts the chamber gets smaller and squeezes the blood out. After each chamber contracts it relaxes. So it fills up with blood again.

The two sides of heart work together. The atria and the ventricles contract and relax at the same time.

Diastole is when the heart muscles are relaxed. Blood flows into the atria from the veins.

Systole is when the heart muscles contract.

First the atria contract and force the blood into the ventricles.

Then the ventricles contract. They force the blood out into the arteries.

The **right ventricle** pumps blood to the **lungs** in the **pulmonary artery**.

The **left ventricle** pumps blood to the rest of the **body** in the **aorta** (main artery).

Oxygenated blood returns to the **left atrium** in the **pulmonary vein**.

The **vena cava** carries deoxygenate blood from the body to the **right atrium**.

After listening to the lesson

A - Complete the following sentences with the missing information:

1. Your heart is nearly all _____.
2. The heart is the _____ that circulates blood around your body.
3. Your heart beats about _____ times per minute.
4. The heart has a _____ side and a _____ side, completely separate.
5. On each side of the heart there are two _____.
6. The upper chambers are called _____.
7. The lower chambers are called _____.
8. Between each atrium and ventricle is a _____.

B - Complete the following sentences with the missing information:

1. _____ is when the heart muscles are relaxed.
2. _____ is when the heart muscles contract.
3. The _____ pumps blood to the _____.
4. The _____ pumps blood to the rest of the _____.
5. The beating of the heart is controlled by the _____.
6. The _____ carry oxygenated blood to the heart muscle.
7. The coronary artery blockage can cause a _____.

C - Say whether the following statements are true (T) or false (F).

1. The heart is enclosed in a membrane called the pericardium (T) (F)
2. Valves are useful to stop blood flowing in the opposite direction (T) (F)
3. The pulmonary vein carries the blood to the right side of the heart (T) (F)
4. The right ventricle pumps the oxygenated blood around the body (T) (F)

5.The deoxygenate blood leaves the heart from the right ventricle (T) (F)

6.The aorta carries blood from the left side of the heart to the body (T) (F)

D - Match the words on the left with the correct definition:

a)Pericardium

1)upper cavity in the heart

b)Aorta

2)pumps blood into the arteries

c)Ventricle

3)membrane enclosing the heart

d)Atrium

4)carries blood from left ventricle

e)Vena cava

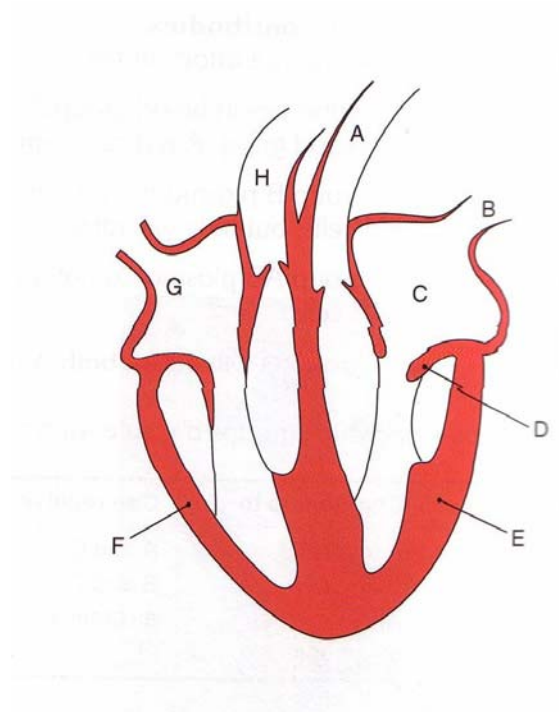
5)carries blood from the lungs

f)Pulmonary vein

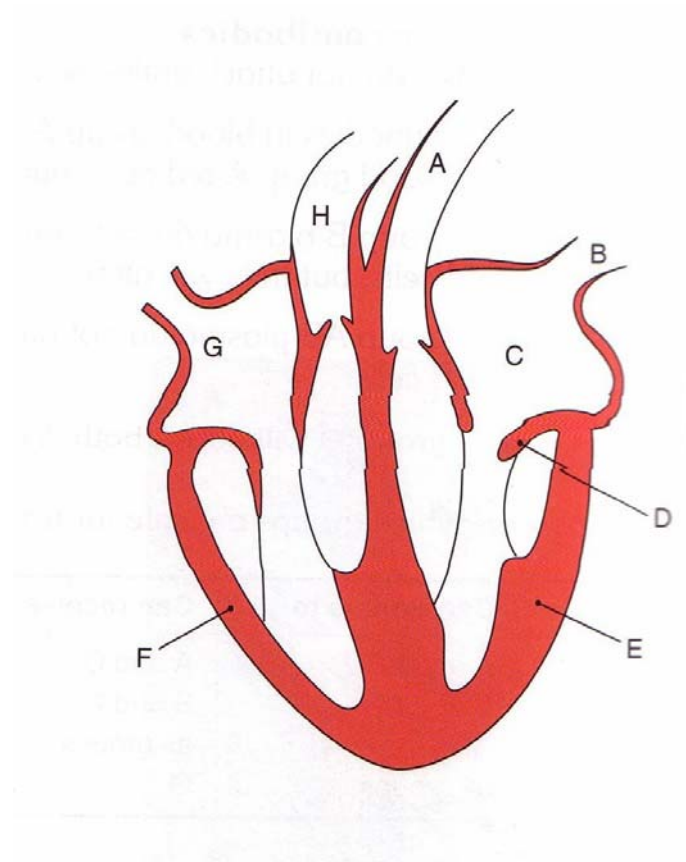
6)carries blood from the body to the heart

E - Look at the diagram of the human heart in section:

A) Name the parts labelled A to H



B)Color the right side blue and the left side red.



F - Order the following sentences starting from the left atrium:

- The left ventricle contracts and pumps blood in the aorta to the rest of body ...
- Deoxygenated blood returns to the right atrium in the vena cava ...
- The right ventricle contracts and pumps blood to the lungs in the pulmonary artery ...
- Oxygenated blood returns to the left atrium in the pulmonary vein ...
- The right atrium contracts and forces the blood into the right ventricle ...
- The left atrium contracts and forces blood into the left ventricle ...

Second lesson

Control of heartbeat

If the heart was removed from the body it would continue to beat.

The beating of the heart is controlled by the **pacemaker**.

This is a group of cells in the right atrium.

The pacemaker sends electrical messages to the heart muscle. These messages stimulate the heart muscle to contract.

The pacemaker also receives information from the brain.

Some nerves slow down the heart rate, others speed it up. So the brain is able to adjust the heart rate to the needs of the body.

The heart's blood supply

Despite being full of blood, the heart needs a blood supply of its own.

Coronary arteries carry oxygenated blood to the heart muscle.

The heart muscle needs energy from respiration in order to contract.

Heart disease

- If a coronary artery became blocked, the oxygen supply to the heart muscle would be cut off. This could cause a **coronary heart attack**: the heart muscle will die. If the damage is extensive, then the person may die.
- A chemical called cholesterol, made in the liver and found in the diet, can stick to the artery walls. This can narrow the artery and slow down the flow of blood. The artery walls become rough. The artery blockage is called a **thrombosis**.

Risk factors

Risk factors are things that can increase the chances of getting heart disease.

Some of them you can't avoid like:

- **inherited genes** (heart disease tends to run in families)
- **age** (the chances increase with age)
- **sex** (men are more likely to get heart disease than women)

Some of the others risk factors you can do something about are:

- **eating fatty foods** (these can increase cholesterol in the blood)
- **being over-weight**
- **smoking**
- **taking little or no exercise.**

Avoiding heart disease

- **take care of your diet:**
 - eat more poultry and fish (they are less fatty)
 - cut down on fried food
 - eat less red meat
 - eat more fresh fruit and vegetables
- **take some regular exercise**
- **do not smoke.**

After listening to the lesson

G - Read the text and answer the following questions:

It may surprise you to know that cholesterol itself isn't bad. In fact cholesterol is just one of many substances created and used by our bodies to keep us healthy.

Some of the cholesterol we need is produced naturally, while some of it comes from the food we eat.

There are two types of cholesterol:

- HDL cholesterol is known as "good" cholesterol, because high levels of HDL protect against heart attack
- LDL cholesterol is known as "bad" cholesterol. When too much LDL cholesterol circulates in the blood, it can slowly build up in the inner walls of the arteries and form a deposit.

1) What is cholesterol?

2) LDL and HDL cholesterol: what's bad and what's good?

3) What can cholesterol do?

H - Answer the following questions:

1) What are the major risk factors that can't be changed?

2) What are the major risk factors you can modify?

3) How can you avoid heart disease?

I - Tick the right answer:

1) The artery blockage is called ...

- a. heart attack.
- b. thrombosis.

2) Age, sex and inherited genes are risk factors...

- a. you can avoid.
 - b. you can't avoid.
- 3) Fatty foods can increase...
- a. cholesterol in the blood.
 - b. sugars in the blood.
- 4) Being over-weight and smoking are risk factors you...
- a. can do something about.
 - b. can't do something about.
- 5) Taking care your diet you ...
- a. can't avoid heart disease.
 - b. can avoid heart disease.
- 6) Taking some regular exercise and physical activity you...
- a. can treat high blood pressure.
 - b. can modify risk factors.

References:

"New Biology for you" (G. Williams - Nelson Thornes)

"GCSE Double Science - Biology" (Edited by R. Parsons)

"Bio-Chem" (G. Roggi, J. Picking - Ed. Zanichelli)

"A New Planet" (M. Spiazzi, M. Tavella - Ed. Zanichelli)

CLIL lesson: "THE HEART"

FINAL TEST

A - Complete the following sentences with the missing information:

1. Your heart is nearly all _____.
2. The heart is the _____ that circulates blood around your body.
3. Your heart beats about _____ times per minute.
4. The heart has a _____ side and a _____ side, completely separate.
5. On each side of the heart there are two _____.
6. The upper chambers are called _____.
7. The lower chambers are called _____.
8. Between each atrium and ventricle is a _____.
9. _____ is when the heart muscles are relaxed.
10. _____ is when the heart muscles contract.
11. The _____ pumps blood to the _____.
12. The _____ pumps blood to the rest of the _____.
13. The beating of the heart is controlled by the _____.
14. The _____ carry oxygenated blood to the heart muscle.
15. The coronary artery blockage can cause a _____.

B - Say whether the following statements are true (T) or false (F).

1. The heart is enclosed in a membrane called the pericardium (T) (F)
2. Valves are useful to stop blood flowing in the opposite direction (T) (F)
3. The pulmonary vein carries the blood to the right side of the heart (T) (F)

4.The right ventricle pumps the oxygenated blood around the body (T) (F)

5.The deoxygenate blood leaves the heart from the right ventricle (T) (F)

6.The aorta carries blood from the left side of the heart to the body (T) (F)

C - Match the words on the left with the correct definition

a)Pericardium

1)upper cavity in the heart

b)Aorta

2)pumps blood into the arteries

c)Ventricle

3)membrane enclosing the heart

d)Atrium

4)carries blood from left ventricle

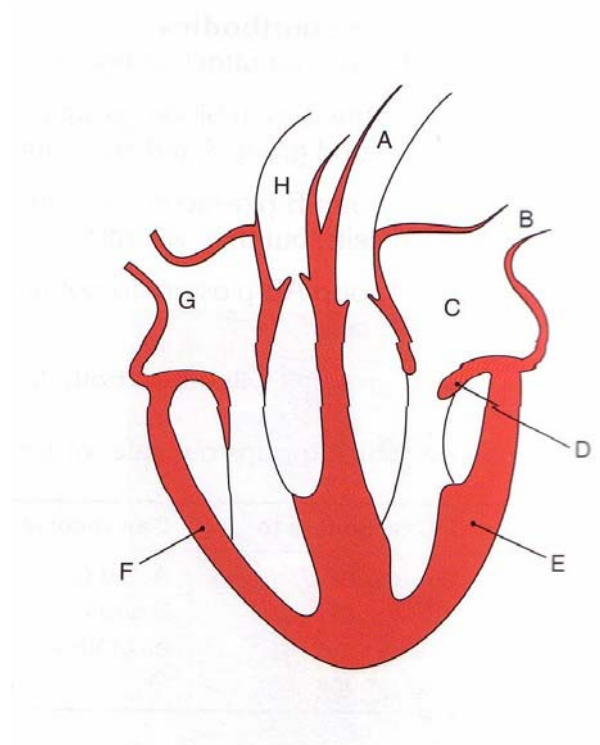
e)Vena cava

5)carries blood from the lungs

f)Pulmonary vein

6)carries blood from the body to the heart

D - Look at the diagram of the heart and name the parts labelled A to H



E - Order the following sentences starting from the left atrium:

- The left ventricle contracts and pumps blood in the aorta to the rest of body ...
- Deoxygenated blood returns to the right atrium in the vena cava ...
- The right ventricle contracts and pumps blood to the lungs in the pulmonary artery ...
- Oxygenated blood returns to the left atrium in the pulmonary vein ...
- The right atrium contracts and forces the blood into the right ventricle ...
- The left atrium contracts and forces blood into the left ventricle ...

F - Answer the following questions:

1. What are the major risk factors that can't be changed?
2. What are the major risk factors you can modify?
3. How can you avoid heart disease?
4. What is cholesterol?
5. LDL and HDL cholesterol: what's bad and what's good?
6. What can cholesterol do?

G - Tick the right answer:

1) The artery blockage is called ...

- a. heart attack.
- b. thrombosis.

2) Age, sex and inherited genes are risk factors...

- a. you can avoid.
- b. you can't avoid.

3) Fatty foods can increase...

- a. cholesterol in the blood.
- b. sugars in the blood.

4) Being over-weight and smoking are risk factors you...

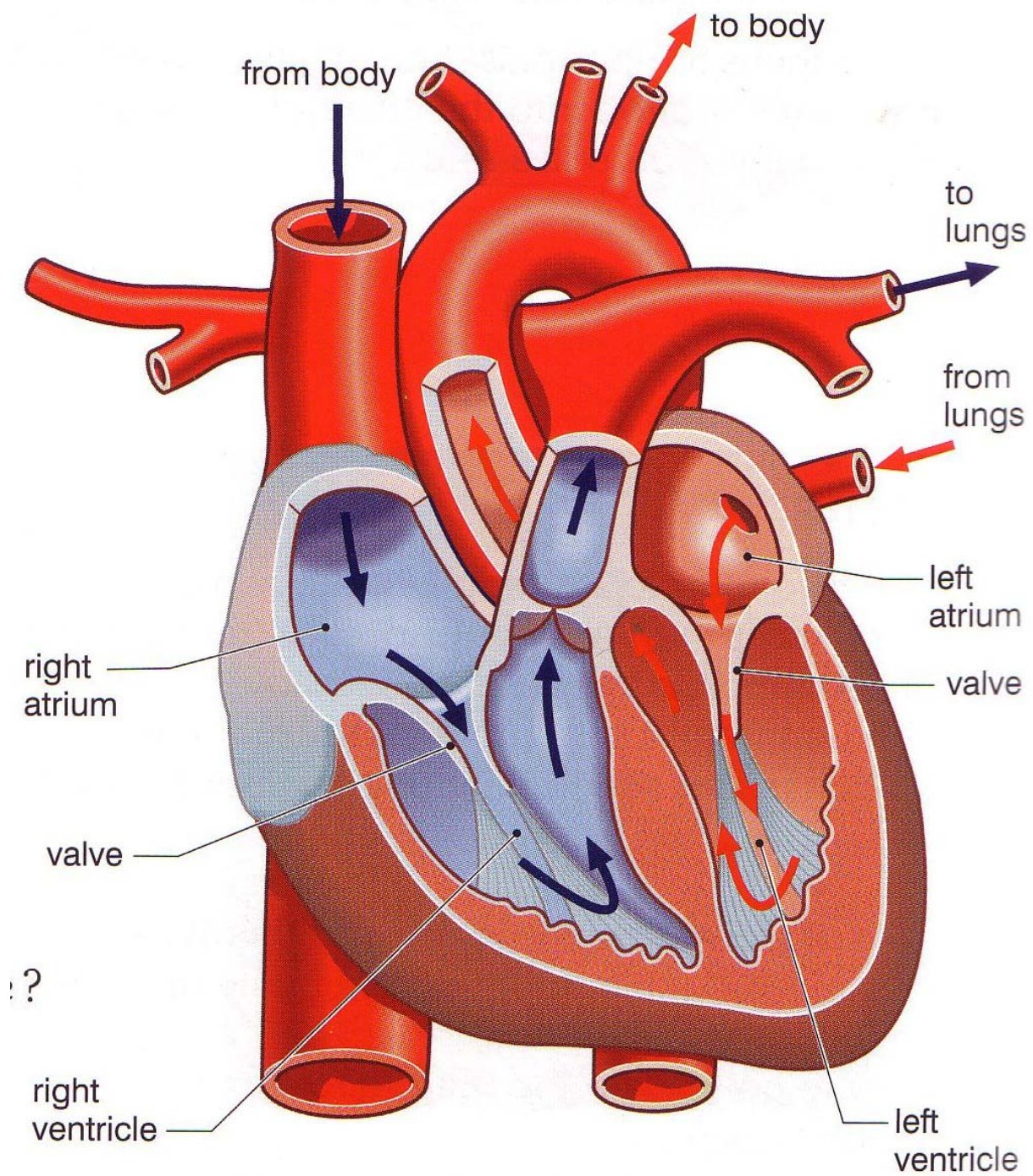
- a. can do something about.
- b. can't do something about.

5) Taking care your diet you ...

- a. can't avoid heart disease.
- b. can avoid heart disease.

6) Taking some regular exercise and physical activity you...

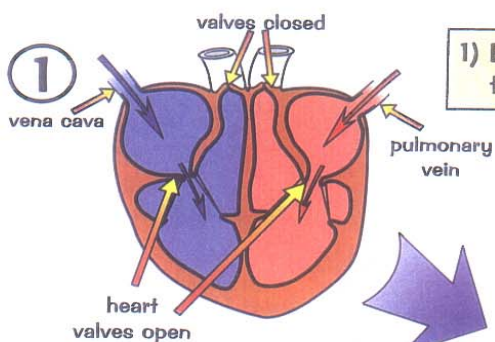
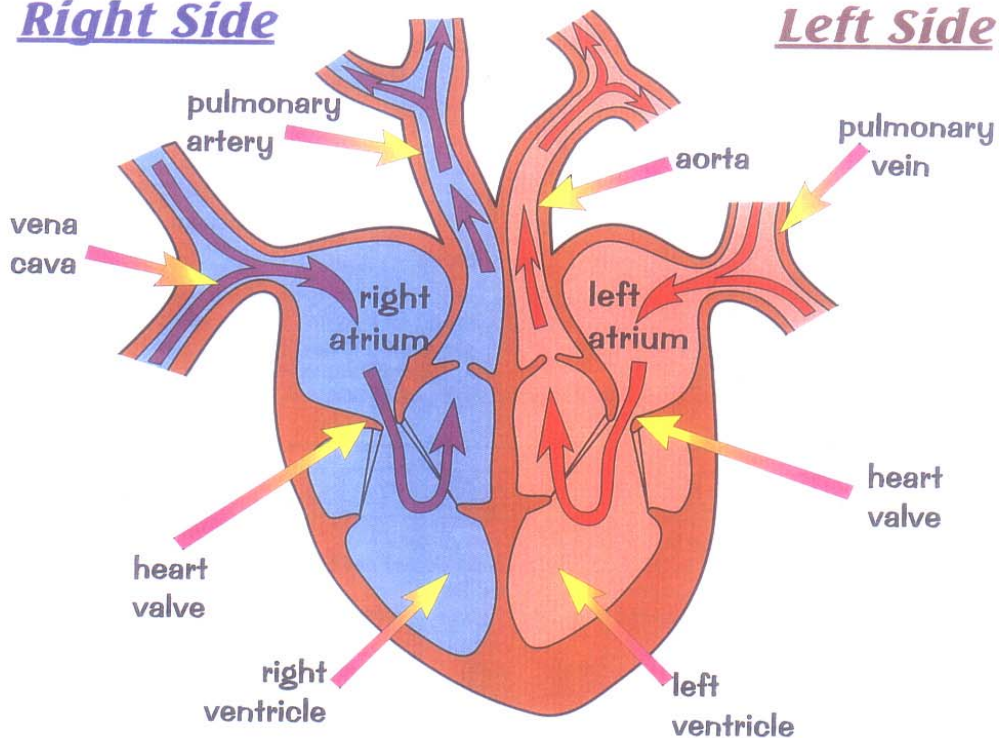
- a. can treat high blood pressure.
- b. can modify risk factors.



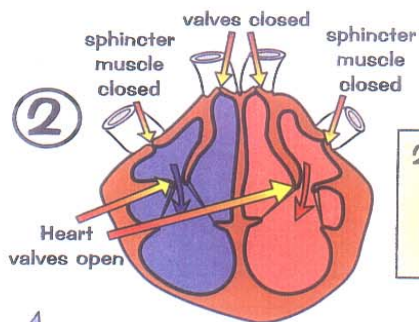
The arrows show how the blood moves through the heart

Right Side

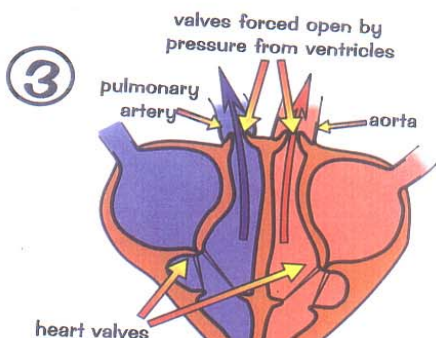
Left Side



1) Blood flows into the two atria.



2) The atria give a gentle beat to push the blood into the ventricles.



3) The ventricles contract forcing blood into the aorta and pulmonary artery.

4) The blood flows down the arteries, the atria fill again and the whole cycle starts over.