

The Cardiovascular System

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Reading

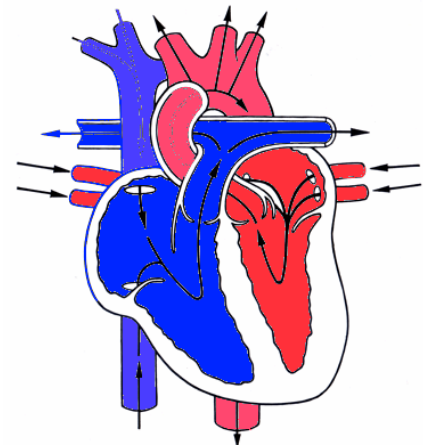
The cardiovascular system consists of the heart, the arteries and veins, and the blood. Often each element of the system is studied separately, however, we are going to combine all the **elements** and discuss them together. The **core** of the cardiovascular system is the heart. The heart is a four chambered muscular pump that **drives** the blood through the circulatory system. The heart is usually said to be about the size of a person's **clenched fist**. It is located in the central part of the chest in an area between the lungs anterior to the vertebral column and posterior to the sternum. The space, called the mediastinum, also contains the thymus gland, the trachea, the ascending, arch and descending aorta and the superior and inferior vena cava. The heart is often described as being "two-pumps-in-one." Before we explain the "two-pumps-in-one" concept we need to **detour** for a moment and **briefly** describe the circulatory system.

The circulatory system consists of arteries and veins that **carry** blood out to the organs, tissues and cells of the body and then return the blood to the heart. By definition arteries carry blood away from the heart and veins carry blood back toward the heart. While it is logical and useful to study the arterial circulation and the venous circulation it is common to subdivide the circulatory system at least once before starting with this approach. The initial subdivision is to divide it into the systemic (to the body) circulation and the pulmonary (to the lungs) circulation. After this subdivision is made, it is much easier to talk about the various arteries and veins of the systemic or pulmonary circulations. When needed, these two main subdivisions can be further subdivided to provide greater accuracy of description. Some examples of additional subdivisions include the hepatic circulation, cerebral circulation and the coronary circulation.

Now we can return to the "two-pumps-in-one" concept; the heart can be viewed as two pumps – the right side pump drives blood through the pulmonary circulation while the left side pump drives blood through the systemic circulation. Each "pump" side consists of an atrium and ventricle.

Use the figure on the right and the below to follow blood flow through the heart. {*Blood flow from the systemic veins, through the right atrium and right ventricle and into the pulmonary arteries is shown in blue to indicate deoxygenated blood. Blood flow from the pulmonary veins through the left atrium and left ventricle and into the systemic arteries is shown in red to indicate oxygenated blood.*}

- ⇒ Blood returns to the right atrium from the veins of the systemic circulation
- ⇒ The right atrium pumps blood into the right ventricle
- ⇒ The right ventricle pumps blood into arteries that supply the lungs (pulmonary circulation)
- ⇒ Blood passes through pulmonary capillaries and enters pulmonary veins
- ⇒ Blood returns to the left atrium from the veins of the pulmonary circulation
- ⇒ The left atrium pumps blood into the left ventricle
- ⇒ The left ventricle pumps blood into the arteries of the systemic circulation
- ⇒ Blood passes through systemic capillaries and enters systemic veins



The Valves

To control the **flow** of blood through the heart and to **prevent** backflow of blood and insure blood flow in only one direction, the heart is **equipped** with two **sets** of valves. The first set is called the AV valves or atria-ventricular valves. The valve between the right atrium and right ventricle is called the tricuspid valve and the **valve** between the left atrium and left ventricle is called the bicuspid valve or mitral valve. These vales **ensure** that blood does not move back into the atria during the powerful contraction of the ventricles. The second set of valves is called the semilunar valves. The valve between the right ventricle and the pulmonary trunk is called the pulmonary semilunar valve and the valve between the left ventricle and the ascending aorta is called the aortic semilunar valve. These valves prevent **backflow** of blood into the ventricles **while** the ventricles **relax** between heart **beats**.

Check Point – Heart Anatomy

Match the terms with the diagram.		
Aortic semilunar valve	A. _____	
Bicuspid valve	B. _____	
Left atrium	C. _____	
Left ventricle	D. _____	
Pulmonary semilunar valve	E. _____	
Right atrium	F. _____	
Right ventricle	G. _____	
Tricuspid valve	H. _____	

Check Point – Everyday Vocabulary

Instructions: Match the “everyday” terms in column A (seen in bold print in the above text) with their contextual meaning in column B.

A	B
A. backflow	1. a part or piece of something
B. beat (of the heart)	2. a critical or important part / a central idea
C. briefly	3. to push something forward / to move something along a path
D. carry	4. to squeeze tightly
E. clinched	5. during the time that something is happening
F. core	6. to make sure something happens / to guarantee that something happens or takes place
G. detour	7. to circulate / to move in a stream
H. drives	8. a device that regulates the flow of something
I. elements	9. to have / to have a something included
J. ensure	10. the hand when all the fingers are flexed and the hand has a somewhat spherical shape
K. equipped	11. to alternative path or route / a difference path than normal
L. fist	12. to do something in a way that uses little time
M. flow	13. to transport
N. prevent	14. to keep something from happening
O. relax	15. a collection of objects
P. sets	16. a situation in which a fluid move in the opposite of the desired or intended direction
Q. valve	17. a condition in which stress, tension or muscle contraction is absent
R. while	18. a contraction of the heart muscle

Technical Vocabulary	Specialized Vocabulary
Mediastinum Right atrium Left atrium Right ventricle Left ventricle Bicuspid valve Tricuspid valve Mitral valve Pulmonary semilunar valve Aortic semilunar valve Artery Vein Capillary Oxygenated Deoxygenated Thymus Trachea Ascending aorta Arch of the aorta (aortic arch) Descending aorta Superior vena cava Inferior vena cava Pulmonary arteries Pulmonary veins	Chest Heart beat Blood flow Contraction Pulmonary circulation Systemic circulation Coronary circulation Hepatic circulation Cerebral circulation

Check Point – Present perfect and past simple

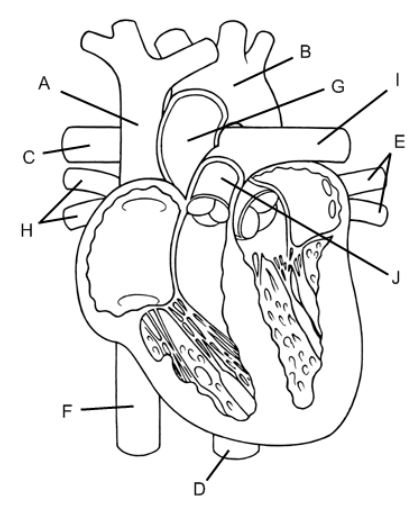
Present perfect is used to discuss events that started at an **unspecified** time in the past and are still relevant now, even if the event has concluded. Past simple is used for events that started in the past, concluded in the past and don't have any particular relevance to the present.

Instructions: Pick the word and tense that best completes the sentence. Add extra words as needed.

come, complete, be, report, perform, has, come, smoke, become, admit

1. The patient's by-pass surgery _____ a complete success.
2. The patient _____ by-pass surgery once before.
3. Have the lab results _____ back yet?
4. I _____ this procedure a million times – don't worry!
5. He _____ to the hospital 3 days ago.
6. He _____ chest pain when he was admitted.
7. She _____ since she was a teenager.
8. Coronary by-pass _____ a routine procedure.
9. The patient still _____ out of the recovery room yet, but I expect he'll be out soon.
10. The patient _____ out of the recovery room two hours ago.

Check Point -- Major Blood Vessels

Match the items with the letters on the diagram.		
<p>Arch of the aorta</p> <p>Ascending aorta</p> <p>Descending aorta</p> <p>Inferior vena cava</p> <p>Left pulmonary artery</p> <p>Left pulmonary veins</p> <p>Pulmonary trunk</p> <p>Right pulmonary artery</p> <p>Right pulmonary veins</p> <p>Superior vena cava</p>	<p>A. _____</p> <p>B. _____</p> <p>C. _____</p> <p>D. _____</p> <p>E. _____</p> <p>F. _____</p> <p>G. _____</p> <p>H. _____</p> <p>I. _____</p> <p>J. _____</p>	

Check Point – Grammar

Instructions: The “d” or “ed” used to make the past tense of verbs can have the sound of “id” {rate ⇒ rated} or it can have the sound of a “t” {fix ⇒ fixed} or it can have the sound of “d” {prepare ⇒ prepared}. Put the words in the top box into the appropriate column based on their ending sound. **** Which sound appears to be the most common?**

associated / attached / called / chambered / clinched / described / desired / detected / distended / equipped / flexed / implanted / inflamed / intended / involved / located / occluded / narrowed / perfused / reduced / relieved / studied / subdivided / thickened / triggered / viewed / weakened		
id	t	d

In Focus – Controlling High Blood Pressure

One of the most frequent problems associated with the cardiovascular system is high blood pressure. There are many different causes of high blood pressure, but essential hypertension is the most common diagnosis. Essential hypertension is hypertension that is unrelated to another health problem. Blood pressure (BP) is normally recorded as two pressure measurements. A common measure of pressure is mmHg (millimeters of Mercury) and a typical measure is 120 mmHg / 80 mmHg or (120 / 80 or 120 over 80). The top value is the systolic pressure and the bottom value is the diastolic pressure.

In general the treatment of essential hypertension is directed at blood volume and the degree of constriction of blood vessels in the systemic circulation. If blood volume is above normal the heart has to

work harder (generated higher pressures)

to move the extra volume of blood

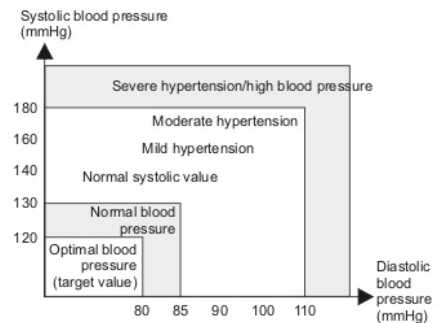
through the circulation. And if the blood

vessels are constricted the resistance to blood flow is increased and the heart has to work harder (generated higher pressures) to overcome the increased resistance. In either case the extra workload puts a strain on the heart, which over time can lead to cardiac problems.

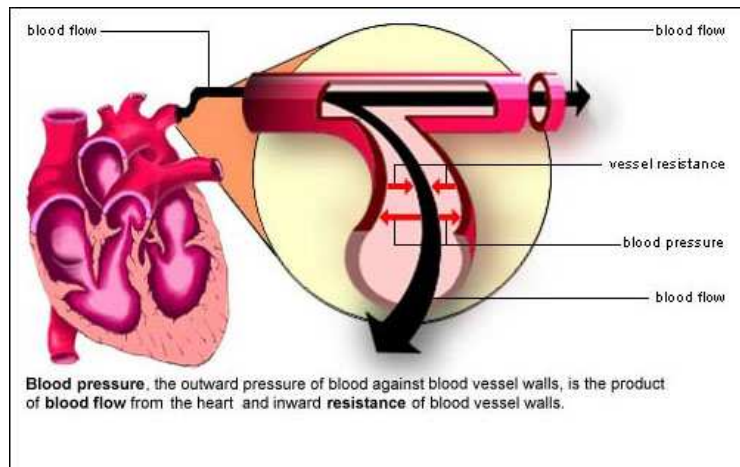
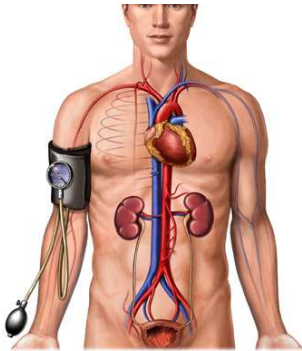
If a patient presents with high blood pressure (systolic pressure > 150 mmHg and / or diastolic pressure > 90 mmHg) some type of treatment is initiated. Lifestyle

changes are usually

part of the treatment program, but pharmacological agents are also usually included. Initial therapy often consists of a diuretic. A diuretic is a drug that decreases blood volume by acting on the kidneys and causing increase urine production. In many mild hypertensive cases a diuretic is sufficient for BP management. However if effective management is not achieved with a diuretic other drugs can be used as alternatives or adjuncts. Two popular types of drugs influence angiotensin. Angiotensin is a naturally occurring compound in the body which causes vasoconstriction. By blocking the effect of angiotensin blood vessel radius is increased and resistance to blood flow is reduced, thereby reducing blood pressure. One type of drug is called an ACE inhibitor. This drug prevents the conversion of an angiotensin precursor into angiotensin. The other type of drug is an ARB angiotensin receptor blocker. This drug bind to the angiotensin receptors of the smooth muscle found in blood vessels and prevents the angiotensin from binding and causing smooth muscle contraction. The forth commonly used types of drug used in treating high blood pressure are calcium channel blockers. These drugs also reduce contraction of smooth muscle in blood vessels and reduce resistance to blood flow.



According to the blood pressure classification by the WHO/ISH.



Instructions: Match the terms in column A with the contextual definitions in column B.

A	B
A. Angiotensin	1. The upper number in a blood pressure measurement
B. Bind	2. Contraction of the heart (ventricles)
C. Blocker	3. Lower number in a blood pressure measurement
D. Calcium channel blocker	4. Period of cardiac relaxation
E. Diastole	5. Naturally occurring compound that can cause a decrease in blood vessel radius
F. Diastolic pressure	6. Force that opposes flow
G. Diuretic	7. Another name for high blood pressure
H. Essential hypertension	8. A narrowing of a blood vessel
I. Hypertension	9. A chemical structure that can bind with a chemical compound
J. Receptor	10. A chemical that can bind to a receptor – but which has no biological effect
K. Resistance	11. To attach
L. Systole	12. A chemical compound which can increase urine production
M. Systolic pressure	13. A chemical that can influence the amount of calcium that enters a smooth muscle cell
N. Vasoconstriction	14. Hypertension that is not secondary to another health problem

Clinical Corner

Aneurysm: If an area of a weakened artery begins to enlarge, bulge or distend the bulging or distended area is called an aneurysm. If a medium sized artery aneurysm ruptures the patient will usually bleed to death before surgical intervention is possible. Aneurysms are often detected when they produced secondary symptoms caused by pressure they put on nearby structures.

Angina pectoris: An ischemic condition of the heart which can produce chest pain on exertion.

Arteriosclerosis: This condition develops when arterial walls become thickened and less elastic. The loss of elasticity can often be seen in the pulse pressure. {Pulse pressure = systolic pressure – diastolic pressure} **arterio = artery, sclero = hard**

Atherosclerosis: A type of arteriosclerosis in which there are degenerative changes in the lining of the blood vessel. The changes often take the form of plaques. These elevated plaques present a danger because that can trigger thrombus formation. Thrombus formation on a plaque in a coronary artery can lead to a myocardial infarction. In coronary arteries, reperfusion can sometimes be achieved through angioplasty and the insertion of a stent. **(athero = soft, thick, sticky substance)**

Bradycardia: An abnormally slow resting heart rate (less than 60 beats per minute). **The prefix “brady” means SLOW.**

Cardiac pace maker (SA node):

Specialized tissue, located in the posterior wall of the right atrium, that set the overall heart beat rate for the heart. If this tissue fails, patients can have artificial pacemakers implanted to takeover the function of the failed pacemaker.

Cardiomyopathies: Any of a number of diseases that involve progressive degeneration of the myocardium. **The prefix “cardio” means HEART, “myo” means MUSCLE and “pathy” means DISEASE.**

Coronary artery by-pass surgery: A procedure in which coronary vessels that have become dangerously occluded through deposition of fatty cholesterol deposits are by-passed with blood vessels grafts taken from other areas of the body. Two common graft choices are the internal mamillary artery in the chest and the saphenous vein from the leg. The by-pass provides an alternative pathway for blood to perfuse the cardiac muscle tissue that is distal to the narrowed section of the original coronary artery.

Coronary artery disease (CAD): A condition in which the coronary arteries are compromised, weakened or reduced in diameter.

ECK (EKG): A recording of the electrical activity of the heart.

Embolus: A blood clot(s) that has broken free of a vessel wall and is circulating with the blood. These clots often form in the deep veins of the legs where blood flow is slow (sluggish). When they break free and enter the circulation they can pass through the right atrium, the right ventricle and enter the arterial side of the pulmonary circulation. However, they are too large to pass through the smallest arteries and capillaries and become lodged in these vessels causing pulmonary embolisms.

Endocarditis: Recall that the suffix “itis” means “inflammation of” – so endocarditis means inflammation of the lining or inner most layer of the heart wall. The endocardium is an endothelial membrane that lines the chambers of the heart and is continuous with the endolethilum of the blood vessels that enter and exit the heart. Rheumatic fever is a common cause of endocarditis. **The prefix “endo” means INTERNAL.**

Heart murmur: A murmur is an abnormal heart sound, associated with the movement of blood through the valves of the heart. Murmurs are usually heard with the use of a stethoscope. Most murmurs are associated with some type of cardiac disease. Murmurs can be caused by stenotic valves (valves with narrowed passageways) or insufficient valves (valve that don’t close tightly or properly). Additionally murmurs can be diastolic murmurs or systolic murmurs. The type and timing of the murmur is often diagnostic of the problem and the valve involved. Generally, a whistling murmur is caused by a stenotic valve, while a swishing murmur is caused by an insufficient valve.

Mitral valve prolapse: A condition in which the mitral valve fails to close properly.

Myocardial infarction (heart attack): A condition in which a coronary artery become occluded. The occlusion causes the tissue distal to the occlusion to become ischemic and, if the occlusion is not relieved, the tissue becomes necrotic. The death of myocardial tissue weakens the heart and limits its pumping effectiveness. Additionally the dead tissue can cause impulse conduction abnormalities that can lead to fibrillation and ultimately death.

Myocarditis: Inflammation of the

myocardium or cardiac muscle tissue of the heart.

Myocardium: Another name for the cardiac muscle that makes up the wall of the heart.

Necrosis: Tissue death as a secondary cause of another problem.

Pericarditis: The heart rest in a fluid filled sac within the mediastinum. The sac is called the pericardium (**peri = around**). When the sac and its fluid contents become inflamed the condition is called pericarditis.

Perfusion: Describes the blood flow to a tissue or organ.

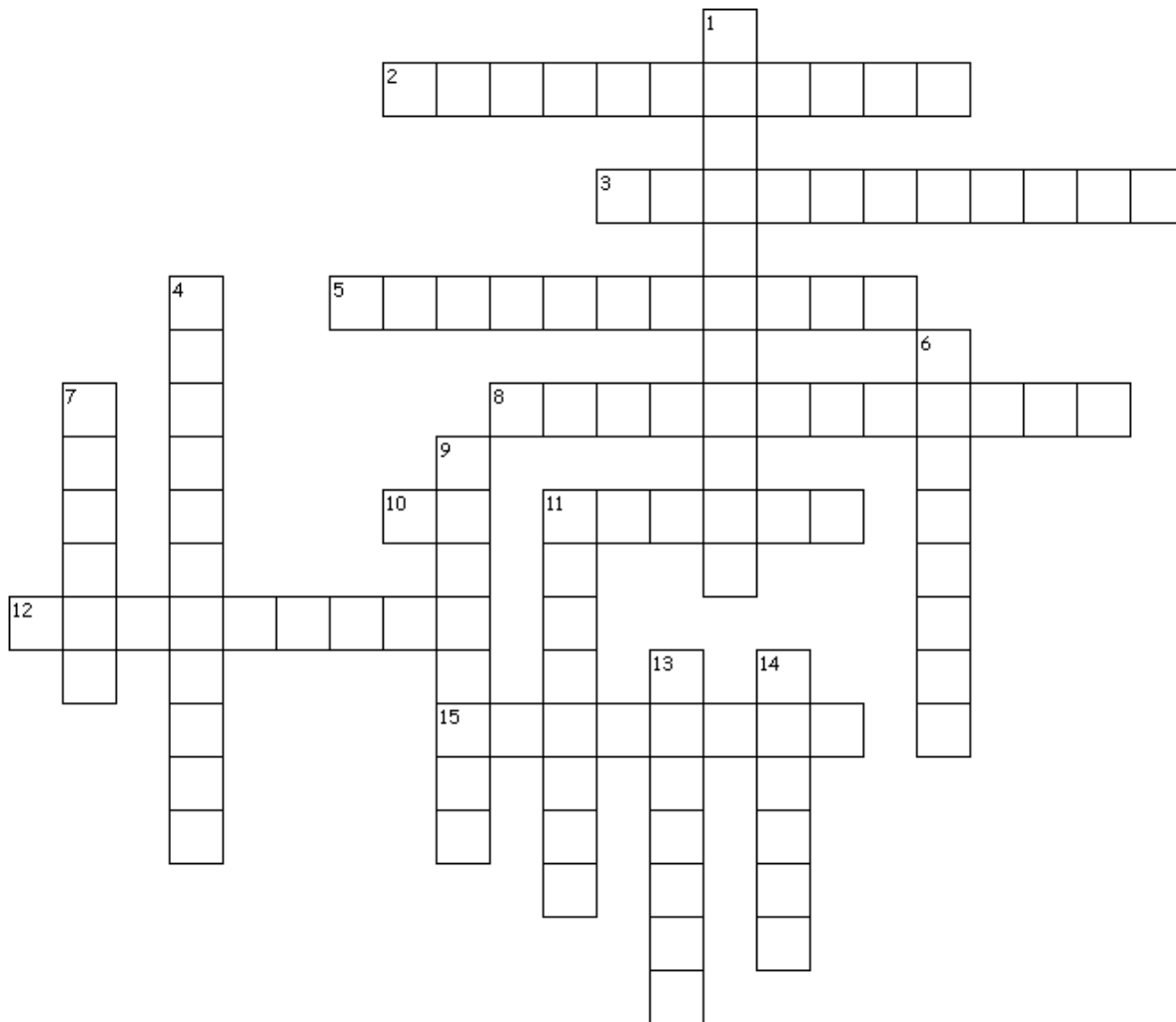
Stethoscope: Device used to listen to the chest or to hear arterial sounds while taking a blood pressure. **(stetho = chest, scope = to examine)**

Tachycardia: An abnormally fast resting heart rate (greater than 100 beats per minute). **The prefix “tachy” means FAST.**

Thrombus: A blood clot within a blood vessel that is attached to the vessel wall and as a result is stationary and not circulating with the blood.

Valvular stenosis: Narrowing of a heart valve. Stenosis often leads to a high pitched, whistling type murmur.

Cross Word Puzzle



Across	Down
2. inner lining of the chambers of the heart	1. resting heart rate of less than 60 beats per minute
3. the space in the center of the chest that contains the heart	4. naturally occurring substance that can cause vasoconstriction
5. device used to listen to the heart	6. reduces blood flow to a tissue
8. another term for high blood pressure	7. the valve between the left atrium and the left ventricle
10. common abbreviation for a heart attack	9. a drug that can increase urine production
11. a heart condition that produces severe pain on exertion	11. an abnormal bulge in a blood vessel
12. common name for the SA node	13. a blood clot that is free in the circulation
15. a stationary blood clot	14. abnormal heart sound

Check Point – Sentence construction

Instructions: Make meaningful sentences by combining the first part of the sentence in column A with the second part in column B.

A	B
<ol style="list-style-type: none"> 1. Blood flow in the deep veins 2. If a coronary artery is completely 3. Low doses of aspirin are often prescribed 4. Patients with a prior history of endocarditis often 5. Patients with angina pectoris report 6. Plagues in coronary arteries can 7. Pulmonary embolism can result when clots that were 8. The atherosclerotic plaque had 9. The bulging artery was 10. The distended vessel was 11. The old mans arteries had become thickened 12. the pain was caused by an 13. The patient had a pacemaker 14. The patients ECK showed 15. The patients tachycardia was linked 16. The thrombus had blocked to the blood flow in a 17. The treatment 18. The whistling sound occurring during ventricular diastole was determined 19. Well conditioned athletes often 20. When a blood vessel is narrowed the 	<ol style="list-style-type: none"> A. putting pressure on the optic nerve. B. intervention was successful. C. detected with a cat scan. D. partially occlude the vessel. E. and inelastic with age. F. area of ischemic heart tissue in the left ventricle. G. lead to thrombus formation and cause an mi. H. to reduce the likelihood of thrombus formation. I. have very slow resting heart rates. J. implanted to takeover the work load of their own damaged SA node. K. occluded it is necessary to either by-pass the artery or perform angioplasty followed by the insertion of a stint. L. blood flow through the vessel is reduced, unless the pressure is increase. M. an abnormality in the QRS complex. N. of the legs is often very sluggish, especially if a person sits most of the day at a desk. O. to be caused by a stenotic mitral valve. P. to chronic use of METH. Q. major vessel and a large part of the right ventricle had become necrotic. R. receive prophylactic antibiotics before invasive dental procedures. S. formed during deep vein thrombosis break free from the vessel wall and enter the circulation. T. severe chest pain if they over exert themselves.

Check Point – Vocabulary

Instructions: Match the words in column A with their contextual meanings in column B. The words are taken from the Clinical Corner.

A	B
A. associated	1. An abnormally enlarge region or area / to bend outward / to push outward
B. attached	2. stretched / to have an increase volume
C. bulge	3. to find / to discover something / to become aware of something
D. detected	4. to become thicker / to become more dense
E. distended	5. to initiate something / to start something
F. elastic	6. where something can be found
G. high pitched	7. to put something into something else
H. implanted	8. to be blocked / to prevent flow of something through a tube or passageway
I. inflamed	9. to reduce a diameter / to reduce an opening / to reduce a passageway
J. insufficient	10. to make smaller
K. intervention	11. to be link with something / to have some type of relationship with something
L. involved	12. to be a part of something / something that is troublesome
M. ischemic	13. to reduce a symptom / to solve a problem
N. located	14. a cellular response to an injury / to experience inflammation
O. narrowed	15. to adhere to something / to be stuck to something / to be fixed to something
P. necrotic	16. a treatment or procedure intended to solve a problem
Q. occluded	17. something that is receiving reduced blood flow
R. plaques	18. the ability of something to stretch and return to its original shape
S. reduced	19. a raised area of tissue on the skin or on inner arterial walls
T. relieved	20. to move slowly / to move without enthusiasm / to be without energy
U. sluggish	21. a sound associated with high fluid velocity through a constricted opening
V. stenotic	22. an opening with a reduced diameter / a passageway that is reduced in size
W. thickened	23. lacking a necessary quality or characteristic
X. tightly	24. dead tissue / tissue death not related to apoptosis
Y. trigger	25. a sound with a high frequency
Z. whistling	26. to close securely / for things to fit together properly / to fit firmly together

Check Point – Grammar

Instructions: Complete the blanks with the best choice. Use the correct form.

can't / don't have to or don't need to / should / shouldn't / need to
1. You _____ smoke anymore and you are going to need to reduce the cholesterol in your diet.
2. You _____ take the entire prescription; once the pain is gone you can stop taking the medication.
3. You _____ start a regular exercise routine. It will help your blood pressure and your cholesterol.
4. You _____ take this medicine whenever you feel any chest pain.
5. If your shoulder hurts, you _____ try putting some ice on it for 15-20 minutes, 3 times a day.
6. You _____ use this medication if you intend to drive and never take it with alcohol.
7. You _____ take the elevator; it will be okay if you climb the stairs, just take it slowly.
8. You _____ take more than 3 per day. However, if the pain is severe you can take up to 5.
9. Until we get his blood pressure stabilized he _____ do any heavy lifting of any kind.
10. Any walking will be good for you; it _____ be fast walking. If you walk slowly, just walk a little longer.

Talking with the Patient

Instructions: work with a partner. One person can read the part of the doctor and the other person can read the part of the patient.

1. D: Good afternoon Mr. Hudson – how have you been?
2. P: Quite well doctor and yourself?
3. D: Quite well also – thanks.
4. D: I see you're here for a check of your blood pressure.
5. P: That's right.
6. D: Well -- please have a seat on the examination table and take your shirt off.
7. P: Okay.
8. D: Have you had any health problems since I saw you last?
9. P: I've had some hay fever problems – for about a month.
10. D: Anything else?
11. P: No, except for that, I've been feeling pretty good.
12. D: Are you taking anything for the hay fever?
13. P: I take some over the counter stuff.
14. D: Okay – I don't suppose you remember the name of that “stuff” do you?
15. P: It's called Contact Cold and Allergy medicine.
16. D: Thanks – and when did you take it last?
17. P: Maybe 2-3 days ago.
18. D: Okay.
19. D: Have you had any headaches, shortness of breath on exertion, lightheadedness when you stand up, cough – anything like that?
20. P: No, uh – well, I have had a slight dry cough, but I think it is the hay fever.
21. D: Any problems urinating or any problems with bowel movements?
22. P: No, that all seems fine.
23. D: No skin problems, no muscle aches or pains, no joint pains?
24. P: No.
25. D: And you're sleeping okay?
26. P: Yes.
27. D: Great – well before I take your blood pressure I want to listen to your chest.
28. P: Okay.

29. D: Well everything sounds fine, so let's take your blood pressure.
30. D: Let me get this wrap around your arm – there.

31. P: Well – how was it?
32. D: It's still a little high. It's 146/94. While that's a marked improvement from the first time I saw you 6 months ago, it's still not where we want it to be.
33. P: I was hoping that it would be normal by now.
34. D: Me too. How is your diet coming along? It looks like you're still carrying quite a bit of fat around your abdomen and in the area around your shoulder blades.
35. P: I think I'm making some progress with my weight.
36. D: Hop down off the table and let's check your weight.
37. P: Okay – if you must.
38. D: We must. Just stand up here on the scale.
39. D: Lets see – you weigh 125 kg.
40. P: Ouch! I was hoping to have lost more.
41. D: Ouch is right. That's only 3 kg less than when I first saw you and we talked about your diet.
42. P: I feel like I'm eating a lot less – and I get some amount of exercise almost every day.
43. D: You may be eating less, but you may have substituted foods that have a higher calorie density.
44. P: What can I do?
45. D: Well – I'm going to send you to a nutritionist. They will work with you to help you put together a diet that is calorie restrictive. They will also give you some ideas on how to avoid feeling hungry and also make sure that your restrictive diet still supplies the proper nutrition.
46. P: That sound like a great idea.
47. D: While you're here I want to do a finger stick test to check your blood glucose and your cholesterol.
48. P: I hate finger sticks – can't you take it from my arm?
49. D: I'm going to do that to – but I want to know your cholesterol and glucose now

– and the blood work from your arm will take a couple of days.

50. P: Okay.
-
51. D: Well that wasn't so bad was it?
52. P: I'll never play the piano again.
53. D: Okay – well it looks like your blood sugar is fine, but your cholesterol is 6.2 mmol / l.
54. P: I've forgotten – is that bad or good?
55. D: It means we can use your blood to fry potatoes.
56. P: I guess that's bad.
57. D: I think I need to adjust your medications – as you loose weight we may have to readjust them, but for now I think we need to get your blood pressure and cholesterol under control.
58. P: Okay.
59. D: I'm going to add a second drug to try to bring your BP down. Microzide, the diuretic you're taking now is working, but it needs some help. This drug is called an ACE inhibitor. It has long and successful track record and I think that in conjunction with the diuretic you're currently taking that your BP will drop to within normal levels.
60. P: Okay.
61. D: You understand that I want you to continue with 50 mg / day of the diuretic – right?
62. P: Yes I understand.
63. D: At higher doses ACE inhibitors can sometimes cause a dry, hacking cough – but at the dose I'm going to start you on, I don't think that will be a problem. However, should such a cough develop I want you to let me know – okay?
64. P: Okay.
65. D: As for your high cholesterol – I'm going to double the amount of Lipitor you are taking – from 10 mg to 20 mg per day. You can finish the prescription you have,

just take two tablets each evening, but the new prescription will be for 20 mg so you will only need 1 tablet each evening.

66. P: Okay.
67. D: Lastly I want you to stop taking the over the counter allergy medication. These medicines can increase your blood pressure. Instead I'm going to give you a prescription for Claritin, 10 mg, and Nasonex for your nasal congestion. The Claritin should be taken once a day until we get through the allergy season. The nasal spray should be used to provide symptomatic relief of congestion. Neither medicine will affect your blood pressure.
68. P: Sounds great.
69. D: And of course I want you to see a nutritionist. I'm going to recommend Dr. Bones – please don't let the name put you off – he's excellent and a very pleasant fellow. Here is his business card – you should call him ASAP to make an appointment.
70. P: Okay – I'll call his office later today.
71. D: Your blood work will be back in a couple of days -- I will call you if I see any problems. I'll also fax a copy over to Dr. Bones – he'll want to have a look at it before he talks to you.
72. P: Okay.
73. D: Well, I guess that about does it for this visit. I want to see you again in 3 months so we can see how things are going.
74. P: Okay – I'll make my next appointment as I leave.
75. D: Great – please call the office if you have any problems – otherwise I'll see you in 3 months.
76. P: Okay – see you then. Bye.
77. D: Bye.

Talking with the Patient

Instructions: working with a partner, try to recreate the interview. Don't just reread it – try to do the interview using your own question and answer variations while using the same basic case profile.

Instructions: Review the interview and find line numbers that correspond to the interview elements listed below. In some cases different aspects of the same interview element may be addressed in different parts of the interview – one such case has been done as an example. The questions in the table below are not in the sequence of the interview.

Interview element	Line numbers
Patient greeting.	
Summary of visit objective	
Request for information on patients current and recent health	
Quick health review with prompts to help patient remember any problems	
Request for information about medications being taken by patient	
Instructions to patient to do something	
Informing the patient about a procedure	
Giving information to the patient regarding a test or measurement	
Explanation to patient regarding a process	
Referral to see another doctor	45 & 69
Explanation for a change in medication	
Request for discontinuation of a medication.	
Explanation for the addition of new medications	
Explanation of how lab results will be handled	
Conclusion of patient visit.	

Check Point – Comprehension

1. What recent health problems does the patient report?
2. What is the purpose of the patient's visit to the doctor?
3. How long has the patient been seeing this doctor for his chronic health problem?
4. What chronic health problems does the patient have?
5. Excluding the allergy medication, what medications was the patient taking prior to the visit?
6. What doses of the medications was the patient taking?
7. What are the new doses of medications the patient will be taking?

Check Point -- Practice Dialog

Instructions: Work with a partner and practice asking and answering the questions regarding the patient profiled below. As you do your practice interviews, the patient can make up any information that is needed but not provided in the patient profile. When you make up information, try to be realistic so that it fits with the patient profile.

Patient Profile:

Male, 59 yo, taxi driver (20 years), complains of shortness of breath on exertion (10 days), history of angina (2 years), smoker -- 40 cigarettes per day (40 years), drinker – 4 to 5 beers per day (40 years), medications: Lipitor, Claritin, Altase, medical problems; hypertension (20 years), hyperlipidemia (20 years), obesity (20 years), seasonal allergies (40 years).

Part 1

Formulate questions to get the following information. Practice note taking in English by writing your partners responses in the space provide.

Question	Response
<ol style="list-style-type: none">1. Patient's name2. Patient's occupation3. Length of employment4. Age5. Height6. Weight7. Marital status8. Children (number of)9. Chief complaint	

Part 2 – reverse roles

Question	Response
<ol style="list-style-type: none">10. Duration of chief complaint11. Onset of chief complaint12. Other medical problems13. Duration of problems14. Smoker (amount), (duration)15. Drinker (amount), (duration)16. Current medications	

Check Point – Vocabulary

Instructions: Use the words or phrases in the box to complete the sentences.

A. allergy medication	G. finger stick	L. short of breath
B. ASAP	H. hay fever	M. successful track record
C. bowel movements	I. lightheaded	N. under control
D. coming along	J. nasal congestion	O. within normal levels
E. cursed	K. over the counter	
F. dry cough		

1. Not only did the angina cause Mr. Peters pain on exertion, it also left him feeling very ____.
2. The new blood pressure medication was too strong and made the patient feel ____ when he stood up to quickly.
3. Every autumn I'm ____ with these awful ____ symptoms.
4. The high doses of medicine needed to control his blood pressure causes a persistent ____ as a side effect.
5. New generation ____ usually do not adversely affect blood pressure, so they can be safely used by hypertensive patients.
6. The high protein, low carbohydrate diet was causing the patient to have difficult and painful ____.
7. Lots of walking and reduced fat in the diet had the patient's weight loss program ____ nicely.
8. A drop of blood from a ____ can be used to quickly test for several different blood values.
9. With exercise and medication, the patient's cholesterol was finally brought ____.
10. This diet plan has a ____ of helping patients lose weight and keep it off.
11. After losing 40 kg, the patient's BP was ____ without the use of any medications.
12. You should always report any ____ you are taking to your physician.
13. Sometimes drugs can have serious side effects – these should be reported ____.
14. Whenever possible, ____ should be treated with topical medications instead of oral medications.

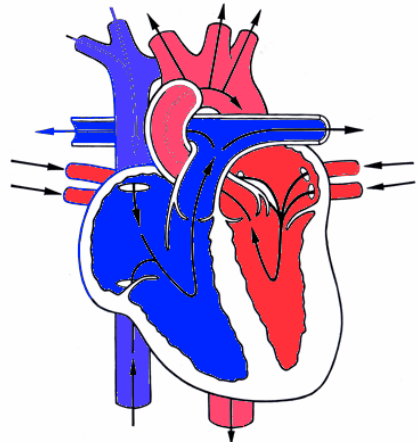
Check Point – Descriptions

Instructions: Work with a partner and take turns describing the movement of blood through the heart. Use the diagram as a guide and the phrases in the box to help you describe the flow of blood. Start your description with the blood entering the right atrium. The first two sentences have been done as examples. Depending on the detail you provide, you may not need all 17 lines.

blood flows from,
blood flows through,
blood enters,
blood leaves,
blood flows into,

blood out of
blood then flows
blood is (then) pumped into
blood is (then) pumped through
from / to / goes / into/ out of

1. Blood enters the right atrium from the superior and inferior vena cava.
2. Blood is then pumped through the tricuspid valve into the right ventricle.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.
- 17.



Talking with the Patient

Instructions: Work with a partner. One person should play the role of the doctor while the other plays the role of the patient. The doctor should practice asking clear, concise questions to get information about the outlined items. Once finished, switch roles and repeat. The patient needs to provide realistic information – the patient can pretend to have one of the following: (1) congestive heart failure or (2) angina pectoris.

- 1) Introductions
 - a) Give your name and get the patient's name, address, age, etc.
 - b) Ask an "open-ended" question about the patient's CC.
 - i) What problem brought you in today?
 - ii) How can I help you today?
- 2) History of CC.
 - a) Chest pain
 - i) Location of chest pain
 - ii) Character of chest pain
 - (1) Crushing
 - (2) Burning
 - (3) Pressure
 - (4) Stabbing
 - (5) Sharp
 - (6) Dull
 - iii) Severity of pain
 - iv) Frequency of pain
 - v) Radiation of pain
 - vi) Relieving / Aggravating factors
 - vii) Related symptoms
 - (1) Sweating
 - (2) Nausea
 - (3) Fatigue
 - (4) Palpitations
 - b) Dyspnea
 - i) On exertion or at rest
 - ii) Ability to perform daily activities
 - c) Orthopnea
 - i) How many pillows are needed to sleep comfortably
 - d) Nocturnal dyspnea

- e) Ankle edema
 - f) Palpitations
 - i) Nature
 - (1) Fast
 - (2) Hard
 - (3) Regular / Irregular
 - ii) Duration
 - iii) Related symptoms
 - (1) Dyspnea
 - (2) Sweating
 - (3) Nausea
 - g) Syncope
 - i) When
 - ii) What were the conditions preceding the event
 - iii) What did the patient feel before it happened
 - iv) Recovery
 - h) Claudication
- 3) Past medical history
- a) Asthma
 - b) Diabetes
 - c) High blood pressure
 - d) Angina
 - e) Stroke
 - f) Heart attack
 - g) Surgical procedures associated with the cardiovascular system
- 4) Drug history (drug and dosage)
- a) OTC drugs
 - b) Prescription drugs
 - c) Drug allergies
- 5) Family history
- a) Heart attack
 - b) Stroke
 - c) High blood pressure
 - d) Diabetes
 - e) Hyperlipidemia
- 6) Lifestyle history

- a) Smoking
 - i) Quantify
 - b) Drinking
 - i) Quantify
 - c) Diet
 - i) Specify
 - d) Occupation
 - i) Stress
- 7) Any connection to CC

Instructions: Take the self-test to see how well you remember the information presented in this unit.

1. The heart _____ / _____ chambers.
 - a. Comprised of / 4
 - b. Consists of / 4
 - c. Composed of / 4
 - d. Contains / 4
2. The heart is located inside a protective sac called the _____.
 - a. Epicardium
 - b. Myocardium
 - c. Mediastinum
 - d. Pericardium
3. A diuretic is used to lower blood cholesterol.
 - a. True
 - b. False
4. A “swishing” sound is often associated with a _____ murmur.
 - a. Stenotic
 - b. Insufficient
5. Claritin is used to treat _____.
 - a. Hypertension
 - b. Hyperlipidemia
 - c. Allergies
 - d. Headaches
6. A blood clot that is moving in the circulation is called a(n) _____.
 - a. Embolus
 - b. Thrombus
 - c. Platelet
 - d. Stroke
7. Blood is pumped from the right ventricle into the _____.
 - a. Systemic circulation
 - b. Coronary circulation
 - c. Pulmonary circulation
 - d. Cerebral circulation
8. The mitral valve is located between the _____ and the _____.
 - a. Right atrium / left atrium
 - b. Right ventricle / left ventricle
 - c. Left atrium / left ventricle
 - d. Left atrium / right ventricle
9. The other name for the mitral valve is the _____ valve.
 - a. Tricuspid
 - b. Bicuspid
 - c. Quadracuspid
 - d. Semilunar
10. A hear rate over 100 beat per minute is termed _____.
 - a. Tachycardia
 - b. Bardycardia
 - c. Fibrillation
11. The term Myocarditis means _____.
 - a. Disease of the heart
 - b. Slow heart rate
 - c. Inflammation of the muscular layer of the heart
 - d. Inflammation of the endocardium
12. The prefix “brady” means _____.
 - a. Fast
 - b. Slow
 - c. Muscle
 - d. Internal
13. If a blood pressure is 120 mmHg / 80 mmHg, what does Hg stand for?
 - a. Hemoglobin
 - b. Mercury
 - c. Atmospheric pressure
14. The valve between the right ventricle and the pulmonary trunk.
 - a. Bicuspid
 - b. Ventricular semilunar
 - c. Pulmonary semilunar
 - d. Aortic semilunar
15. When a blood clot blocks the flow of blood in a coronary blood vessel it is called a:
 - a. MI
 - b. Stroke
 - c. Heart attack
 - d. A or C
16. Blood in the pulmonary arteries is:
 - a. Rich in oxygen
 - b. Poor in oxygen
 - c. On its way to the heart
 - d. On it way to the body.
17. Arteries always carry blood that is rich in oxygen.
 - a. True
 - b. False
18. Veins always carry blood toward the heart.
 - a. True
 - b. False
19. The aorta is the initial artery of the systemic circulation.
 - a. True
 - b. False
20. The prefix “athero” means.
 - a. Liquid
 - b. Hard
 - c. Gooey
 - d. Gaseous

Suggested Mini-Lectures

The mini-lectures listed below can be used as topics for instructors to add additional information to this unit or the topics can be assigned to students for classroom presentations.

- Further discussion of blood flow through the heart
 - Function of valves
- Further discussion of heart anatomy
- Assign some of the terms from the Clinical Corner section for 2-3 minute long individual class presentations.
- Basic cell structure of cardiac muscle cells
 - Sarcolemma
 - Sarcoplasmic reticulum
 - T-tubules
 - Myofibrils
 - Actin
 - Troponin
 - Tropomyosin
 - Myosin
- Basics of impulse conduction through the heart
 - SA node
 - AV node
 - Bundle branches
 - Purkinje fibers
- Control of heart rate by the SNS and PNS.
- Discussion of blood pressure
 - Systolic pressure
 - Diastolic pressure
 - Pressures within the left ventricle
 - Pressures within the right ventricle
 - Pressures across the systemic circulation
 - Pressures across the pulmonary circulation
- Blood makers for a hard attack
 - CK-MB
 - cTnT
 - cTnI
- Mechanism of action for:
 - ACE inhibitors
 - ARB drugs
 - Ca Channel blockers