



Cardiovascular - Circulatory System

The cardiovascular system (also known as the circulatory system) is composed of the heart, blood, and blood vessels. The system is known as a closed system because the blood never leaves the system of blood vessels consisting of arteries, capillaries and veins. Arteries deliver oxygenated blood to the tissues and organs whereas veins bring deoxygenated blood back to the heart and lungs. Blood flows from arteries and veins through capillaries, which are the thinnest and most numerous blood vessels.

The cardiovascular system is one of the most important systems in the body as none of our cells and tissues can function without adequate oxygen and thus blood supply. If there are any problems with the heart, the rest of the body is greatly affected. Due to lifestyle, over 50 million Americans have cardiovascular problems, with most other Western countries also facing high and increasing rates. In the United States and European countries, cardiovascular disease is the leading cause of death, usually because it is detected too late and adequate therapeutic measures can no longer be taken. Health can be improved through healthy eating, exercise, and not smoking.

Acute Coronary Syndromes

The most common indicator of heart attack, chest pain results from a spectrum of conditions involving chest discomfort or other symptoms caused by lack of oxygen to the heart muscle. The unification of these manifestations of coronary artery disease under a single term reflects the understanding that these are caused by a similar sequence of events characterized by erosion, fissuring, or rupture of a pre-existing plaque, leading to clotting within the coronary arteries and impaired blood supply to the heart muscle.

Indication	Company	Product	Phase
Acute Coronary Syndromes	Portola Pharmaceuticals Inc	PRT060128 / ADP (P2Y12) Receptor Antagonist	II
	VIA Pharmaceuticals Inc	VIA-2291	II
	CV Therapeutics Inc	Ranexa (ranolazine extended-release tablets)	III

Angina

Angina, the most common symptom of coronary artery disease, is chest pain due to an inadequate supply of oxygen to the heart muscle. The chest pain of angina is typically severe and crushing. There is a feeling just behind the breastbone of pressure and suffocation.

Indication	Company	Product	Phase
Angina	Angiogenix Inc	Acclaim	II
	CV Therapeutics Inc	Ranexa (ranolazine)	III
	CV Therapeutics Inc	Ranexa (ranolazine extended-release tablets)	M

Arrhythmias

In an arrhythmia, the heartbeats may be too slow, too rapid, too irregular, or too early. Rapid arrhythmias (greater than 100 beats per minute) are called tachycardias. Slow arrhythmias (slower than 60 beats per minute) are called bradycardias. Irregular heart rhythms are called fibrillations (as in atrial fibrillation and ventricular fibrillation). When a single heartbeat occurs earlier than normal, it is called a premature contraction.

Indication	Company	Product	Phase
Arrhythmias	CV Therapeutics Inc	Tecadenoson	III
	Impax Laboratories Inc	Sotalol Hydrochloride Tablets	M

Atherosclerosis

Atherosclerosis refers to the process of progressive thickening and hardening of the walls of medium-sized and large arteries as a result of fat deposits on their inner lining and is ultimately responsible for much coronary artery disease and many strokes.

Company	Product	Phase	Indication
Anthera Pharmaceuticals Inc	A-002	II	Atherosclerosis

Atrial Fibrillation

Atrial fibrillation is an irregular heart rhythm, or arrhythmia, that starts in the upper parts of the heart. Normally, the heart beats in a strong, steady rhythm. In atrial fibrillation, a problem with the heart’s electrical system causes the upper part of the heart to quiver, or fibrillate. The quivering upsets the normal rhythm between the atria and the ventricles of the heart. The ventricles may beat fast and without a regular rhythm. Atrial fibrillation is dangerous because it greatly increases the risk of stroke. If the heart doesn’t beat strongly, blood can collect, or pool, in the atria. Pooled blood is more likely to form clots. If the heart pumps a clot into the bloodstream, the clot can travel to the brain and block blood flow, causing a stroke. Atrial fibrillation can also lead to heart failure or heart attack.

Company	Product	Phase	Indication
ARYx Therapeutics	ATI-2042	II	Atrial Fibrillation
ARYx Therapeutics	ATI-5923	II	
CV Therapeutics Inc	Tecadenoson	II	
Bayer HealthCare	Betapace AF (sotalol hydrochloride)	M	

Blood Clot

Blood that has been converted from a liquid to a solid state inside the circulatory system poses a potential danger. Stationary, a thrombus, or a blood clot, is inactive. But if it moves from that location through the bloodstream it is referred to as an embolus and can potentially decrease or cut off the flow of blood to tissue, resulting in death, stroke or heart attack.

Company	Product	Phase	Indication
Portola Pharmaceuticals Inc	PRT054021 / Factor Xa Inhibitor	II	Thrombosis
Genentech Inc	Cathflo Activase (alteplase)	M	Blood Clot

Cardiac Surgeries

One of many forms of bypass surgery that can create new routes around narrowed and blocked coronary arteries, cardiac surgeries permit increased blood flow to deliver oxygen and nutrients to the heart muscle. These surgeries are an option for selected groups of patients with significant narrowings and blockages of the heart arteries. The bypass graft for a Cardiopulmonary Bypass Graft (CABG) can be a vein from the leg or an inner chest-wall artery. CABG surgery is one of the most commonly performed major operations. Coronary artery disease develops because of hardening of the arteries that supply blood to the heart muscle.

Indication	Company	Product	Phase
Coronary Artery Bypass Graft Surgery	Lumen Therapeutics	LT-1951	II
Cardiac Surgery	Radiant Medical Inc	Reprieve Endovascular Temperature Therapy System	M

Cardiovascular Diseases

Cardiovascular diseases are any such ailments that affect the heart or blood vessels. Cardiovascular diseases include arteriosclerosis, coronary artery disease, heart valve disease, arrhythmia, heart failure, hypertension, orthostatic hypotension, shock, endocarditis, diseases of the aorta and its branches, disorders of the peripheral vascular system, and congenital heart disease.

Indication	Company	Product	Phase
Cardiovascular Diseases	KAI Pharmaceuticals Inc	KAI-9803	II
	Novartis AG	Betaferon / Betaseron (interferon beta- 1b)	II
	VIA Pharmaceuticals Inc	VIA-2291	II
	XOMA Ltd	Neuprex (opebecan)	II
Congestive Heart Failure	BAS Medical Inc	Relaxin	II
	CV Therapeutics Inc	Adentri / BG9928	II
	Cytokinetics Inc	CK-1827452 / CK-452	II
Coronary Artery Disease	BioCardia Inc	Gene Therapy	II
Peripheral Arterial Disease	BioMarin Pharmaceutical Inc	6R-BH4 (sapropterin dihydrochloride)	II
Peripheral Vascular Disease	Angiogenix Inc	Angx 1039	II
Cardiovascular Diseases	Endomatrix Inc	Provasca / Actothil	M
Congestive Heart Failure	Scios Inc	Natrecor (nesiritide)	M

Hypercholesterolemia (High Cholesterol)

Hypercholesterolemia, or high blood cholesterol, is characterized by the presence of high levels of cholesterol in the blood. It is not considered a disease, though it is a metabolic abnormality that can accompany many other diseases, most often cardiovascular disease. Over time, elevated levels of cholesterol in the blood can lead to atherosclerosis and a number of other cardiovascular diseases such as angina, heart attack, strokes, and peripheral artery disease. In the United States, approximately 101 million people, or 37 percent of the population, have high cholesterol.

Company	Product	Phase	Indication
Titan Pharmaceuticals Inc	DITPA	II	Hypercholesterolemia
Impax Laboratories Inc	Colestipol hydrochloride	M	
Impax Laboratories Inc	Fenofibrate Capsules	M	
Next Pharmaceuticals Inc	Flavoxine	M	

Hypertension (High Blood Pressure)

Hypertension, or more commonly referred to as high blood pressure, is a “silent” condition. It can cause blood vessel changes in the back of the eye (retina), abnormal thickening of the heart muscle, kidney failure, and brain damage. It is defined by a repeatedly elevated blood pressure where the systolic pressure is above 140 and the diastolic pressure is above 90.

Company	Product	Phase	Indication
Impax Laboratories Inc	Nadolol (bendroflumethiazide)	A	Hypertension
Impax Laboratories Inc	Nadolol with Bendroflumethiazide	A	
BioMarin Pharmaceutical Inc	6R-BH4 (sapropterin dihydrochloride)	II	
Gilead Sciences Inc	Darusentan (darusentan)	III	
PDL BioPharma Inc	Cardene I.V. (nicardipine hydrochloride)	M	
PDL BioPharma Inc	Hydralazine hydrochloride	M	
Actelion	Ventavis® (iloprost) Inhalation Solution	M	Pulmonary Arterial Hypertension

Hypotension (Low Blood Pressure)

Any blood pressure that is below the normal expected for an individual in a given environment is diagnosed as hypotension, which is the opposite of hypertension (abnormally high blood pressure). Hypotension is a relative term because the blood pressure normally varies greatly with activity, age, medications, and underlying medical conditions. Low blood pressure can result from conditions of the nervous system, conditions that do not begin in the nervous system, and drugs.

Company	Product	Phase	Indication
Impax Laboratories Inc	Midodrine Hydrochloride Tablets	M	Hypotension

Myocardial Infarction (Heart Attack)

A heart attack, or myocardial infarction (MI), causes permanent damage to the heart muscle and more than 1 million Americans have heart attacks each year. Generally attacks are caused by atherosclerosis, the build-up of plaque deposits in the arteries. Occasionally, these fatty deposits burst, causing blood clots to form. These clots block blood from flowing to the heart, and the oxygen-deprived muscle quickly becomes damaged and heart attack ensues.

Indication	Company	Product	Phase
Myocardial Infarction	KAI Pharmaceuticals Inc	KAI-9803 / CS-9803	II
	VM Discovery Inc	VMD-30283	II
	Radiant Medical Inc	Relieve Endovascular Temperature Therapy System	III
	Genentech Inc	Activase (alteplase)	M
	Genentech Inc	TNKase (tenecteplase)	M
	PDL BioPharma Inc	Retavase (reteplase)	M
	Radiant Medical Inc	SetPoint Endovascular Temperature Management System	M

Stroke

A stroke occurs when a blood vessel in the brain is blocked or bursts. Without blood and the oxygen it carries, part of the brain starts to die. The part of the body controlled by the damaged area of the brain can't work properly. Brain damage can begin within minutes, so it is important to know the symptoms of stroke and act fast. Typically, a stroke is caused when an artery to the brain is blocked by a clot which typically occurs in a blood vessel that has previously been narrowed due to atherosclerosis. When a blood clot or a piece of an atherosclerotic plaque (a cholesterol and calcium deposit on the wall of the artery) breaks loose, it can travel through the circulatory system and lodge in an artery of the brain, plugging it up and stopping the flow of blood.

Indication	Company	Product	Phase
Stroke	Neurobiological Technologies Inc	Viprinex (ancrod)	III
Ischemic Stroke	Neurobiological Technologies Inc	Viprinex (ancrod)	M
Stroke	Genentech Inc	Activase (alteplase)	M

Varicose Veins

Varicose veins are gnarled, enlarged veins. For many people, varicose veins and spider veins — a common, mild and medically insignificant variation of varicose veins - are simply a cosmetic concern. For other people, varicose veins can cause aching pain and discomfort. Sometimes the condition leads to more serious problems. Varicose veins may also signal a higher risk of other disorders of the circulatory system.

Indication	Company	Product	Phase
Varicose Veins	BioForm Medical Inc	Aethoxysklerol	III