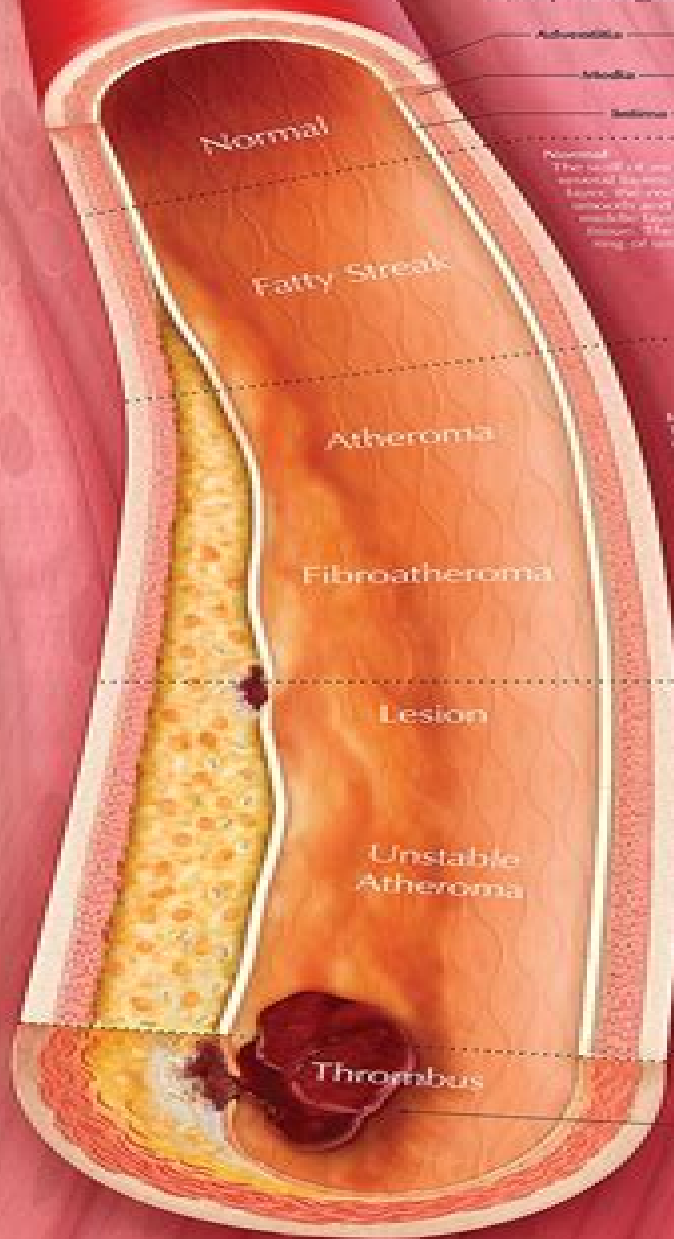




# ATHEROSCLEROSIS

## Artery Changes



Adventitia

Media

Lumen

Endothelium

Normal

The wall of an artery has several layers. The inner layer, the endothelium, is smooth and reflects the blood. The middle layer is composed of muscle. The outer layer is a ring of connective tissue.

Fatty Streak

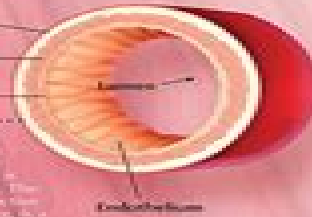
Atheroma

Fibroatheroma

Lesion

Unstable Atheroma

Thrombus



Initial injury

The artery's endothelium becomes injured or diseased. When blood cells move out of the bloodstream, through the weakened lining, and into artery's wall, it does so under pressure. They transform into foam cells. Over time, they multiply, making cholesterol.



Plaque

Lesion

Media

Development

Smooth muscle cells move into the endothelium and multiply. Cell debris, cholesterol crystals, and calcium also accumulate. This lump of cells and material forms an atheroma, or plaque.



Thrombus

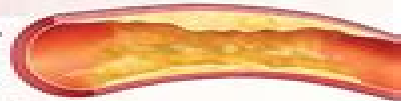
Late stage

As it grows larger, the plaque thickens the artery's wall and bulges and tears the lining. This narrows the lumen and blocks blood flow through the artery. Plaque that only on blood flow does the artery do not receive enough oxygen.

If the plaque splits open ruptures the artery's wall and blood can enter the lumen. This causes a blood vessel on the artery's wall to tear which weakens the artery's lining. The tear of the blood flow. This causes a point of blood clot or plaque break off and travel through the bloodstream to block an artery elsewhere.

## What Is Atherosclerosis?

Arteries carry oxygen-rich blood from your heart to the rest of your body. Healthy arteries are flexible and elastic. Atherosclerosis is a disease in which deposits of fatty material, called **atheromas** or **plaques**, develop in walls of medium-sized and large arteries. Atheromas make arteries narrow and hardened, which leads to blocked blood flow to the brain, heart, kidneys, other vital organs, and legs.



## Causes

Atherosclerotic plaques are the result of repeated, subtle injuries to the arterial wall. This injury may be the result of physical trauma from turbulent blood flow (as in hypertension) or from inflammatory stresses from abnormal levels of chemicals in the bloodstream (as in uncontrolled diabetes or high blood cholesterol levels).

**Risk factors associated with the development of atherosclerosis**

- High blood pressure
- Using any type of tobacco
- Diabetes
- High blood cholesterol levels
- Obesity
- Physical inactivity
- Poor diet
- Family history
- Advancing age
- Being male



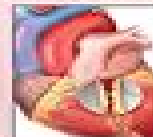
## Symptoms

Atherosclerosis develops slowly over time and mild atherosclerosis has no symptoms at all. When symptoms appear, they vary from person to person and depend on where the affected artery is located and whether it is gradually narrowing or suddenly blocked.

- The typical symptoms resulting from a **gradual** narrowing of the artery is chest pain, shortness of breath, pain in one or both arms, left shoulder, neck (jaw or back, dizziness, nausea). These symptoms may not appear until the artery's blood flow is reduced by more than 50%.
- **Sudden**, severe symptoms, such as **stroke**, **heart attack**, or **clot**, occur when plaques suddenly burst and a blood clot, or **thrombus**, suddenly develops and completely blocks blood flow through the artery.



## Complications



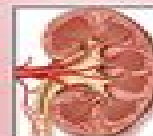
**Coronary Artery Disease (CAD)**

Arteries supplying the heart become narrowed reducing blood flow to the heart muscle and leading to angina pectoris, heart attack, or heart failure.



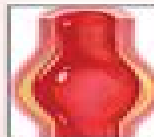
**Stroke**

Cerebral artery disease affects the arteries on each side of the neck that supply the brain, leading to transient ischemic attacks and stroke.



**Kidney Disease**

Chronic kidney disease affects renal arteries, leading to kidney failure and renal hypertension.



**Aneurysm**

An aneurysm may develop if the plaque weakens the arterial wall. This dangerous bulging of an artery may rupture, causing life-threatening bleeding.



**Peripheral Arterial Disease (PAD)**

PAD affects the arteries to the legs, arms, and pelvis, leading to pain and cramping with walking, intermittent claudication, numbness, and increased risk of infection.

## Treatments & Tips

### Medications

Take medications to lower cholesterol, control blood pressure, control diabetes, and prevent blood clots.

### Surgery

Surgeries, such as angioplasty, coronary artery bypass graft, or carotid endarterectomy, may be necessary to improve blood flow to the affected tissue.

### Healthy Lifestyle Choices

A healthy lifestyle can reduce the risk of developing atherosclerosis or improve atherosclerotic symptoms.

- Stop using tobacco.
- Improve diet to lower cholesterol.
- Exercise physically as often.
- Maintain a healthy weight.
- Control high blood pressure.
- Control diabetes.

# Atherosclerosis Ix

**Gotthard Schettler, Andreas J.R.  
Habenicht**



## **Atherosclerosis Ix:**

**Genetics of Cardiovascular Disease** ,2014-04-18 This volume of the esteemed Progress in Molecular Biology and Translational Science series focuses on cutting edge research related to the genetics of cardiovascular disease Written by top experts in the field this volume covers a range of topics including Genetic models of atherosclerosis MicroRNAs in cardiovascular disease The role of the transcription factor KLF2 in vascular development and disease Zebrafish as models of cardiovascular disease and hematopoietic development Progress in Molecular Biology and Translational Science provides a forum for discussion of new discoveries approaches and ideas in molecular biology It contains contributions from leaders in their fields and abundant references The authors are all experts in the field The reviews are in themselves comprehensive Each topic has the potential to lead to advances in therapy of cardiovascular disease *Frontiers in Cardiovascular Health* Naranjan S. Dhalla, Arun Chockalingam, H. Ivan Berkowitz, Pawan K. Singal, 2012-12-06 The Frontiers in Cardiovascular Health varies between and within nations depending upon the level at which the battle is fought for better cardiovascular health According to the 1997 World Health Report 15 million deaths i e 30% of the total number of deaths were attributable to cardiovascular diseases and this number is on the rise The projection for the year 2020 is quite alarming with an expected cardiovascular mortality reaching 50 million Much of this burden is projected to occur in developing countries more specifically in the most populous countries of the world namely China and India These countries are already burdened with infectious and parasitic diseases and are trying to eradicate such diseases With increasing life expectancies people all over the world especially in developing countries are exposed to degenerative atherosclerosis resulting in increased cardiovascular mortality and morbidity In developing countries resources available for health care are very limited For example many of the African countries spend less than 10 per person per year on his/her entire health care let alone cardiovascular health The average health care budget for nearly two thirds of the global population is well below 100 per year on a per capita basis Therefore in developing countries health promotion and primary prevention are the frontiers by necessity Improving awareness and health education is not only a matter of choice but is an absolute necessity **Atherosclerosis IX** Olga Stein, Shlomo Eisenberg, Yechezkiel Stein, 1992 *Principles and Treatment of Lipoprotein Disorders* Gotthard Schettler, Andreas J.R. Habenicht, 2012-12-06 Major advances have been made in the understanding of the molecular mechanisms of atherosclerosis the disease that still affects more than 50 percent of the population in the highly industrialized countries This volume covers the most recent advances in the treatment of hyperlipidemia It represents a necessary update because molecular mechanisms of atherogenesis have been discovered in the past few years and their molecular mechanisms of action identified Extensively treated are the molecular mechanisms of disease etiology of arteriosclerosis in relation to the major risk factor hyperlipidemia rationale for more effective treatment of this disease by dietary means the treatment of associated or causing diseases and the treatment using hypolipidemic drugs **Treatment**

**of Severe Dyslipoproteinemia in the Prevention of Coronary Heart Disease** A. M. Gotto Jr., M. Mancini, W. O. Richter, P. Schwandt, 1993-12-16 *Atherosclerosis*, 1974 **Membrane Fluidity in Biology** Roland C. Aloia, Joan M.

Boggs, 2013-09-24 *Membrane Fluidity in Biology Volume 3 Disease Processes* focuses on the relationship of membrane lipid alterations and membrane fluidity to various pathological conditions providing unique phenomenological conceptualizations of disease states This book compiles comprehensive reviews on topics such as respiratory distress syndrome diabetes and receptor function muscular dystrophies atherosclerosis alcohol membrane effects and lymphocyte function and cancer This publication also evaluates the interplay between membrane lipid alterations and membrane fluidity and abnormal cellular function emphasizing how possible alterations in membrane lipids and cholesterol and consequent changes in membrane fluidity can influence normal cellular activity and lead to pathological cellular function This volume is intended for molecular and cellular biologists clinician scientists struggling with an understanding of the mechanisms of pathological processes and biophysicists seeking research problems in pathology to study *New Research on Alzheimer's Disease* Eileen M.

Welsh, 2006 Dementia is a brain disorder that seriously affects a person's ability to carry out daily activities The most common form of dementia among older people is Alzheimer's Disease AD which involves the parts of the brain that control memory thought and language Age is the most important known risk factor for AD The number of people with the disease doubles every 5 years beyond age 65 AD is a slow disease starting with mild memory loss and ending with severe brain damage The course the disease takes and how fast changes occur vary from person to person On average AD patients live from 8 to 10 years after they are diagnosed though the disease can last for as many as 20 years Current research is aimed at understanding why AD occurs and who is at greatest risk for developing it improving the accuracy of diagnosis and ability to identify who is at risk developing discovering and testing new treatments for behavioural problems in patients with AD This book gathers state of the art research from leading scientists throughout the world which offers important information on understanding the underlying causes and discovering the most effective treatments for Alzheimer's Disease

**Cardiometabolic Diseases** Gundu H. R. Rao, Undurti N. Das, 2024-10-04 Cardiometabolic diseases are a group of metabolic dysfunctions mainly characterized by insulin resistance impaired glucose tolerance dyslipidemia hypertension and central adiposity that are major contributors to increased risk of acute vascular events such as myocardial infarction heart failure and stroke *Cardiometabolic Diseases Molecular Basis Early Detection of Risks and Management* provides detailed information on all aspects of metabolic dysfunctions and associated risks for cardiometabolic diseases including a thoughtful discussion of cellular and molecular mechanisms involved in the progression of metabolic risks the approaches for the early detection and robust management of metabolic risks Written by a team of expert contributors this book is useful reading for researchers and clinicians interested on recent advances in etiology of cardiometabolic diseases the latest noninvasive approaches for diagnosis risk assessment tools therapeutic strategies and also aspects of prevention of cardiometabolic

diseases Covers all aspects of cardiometabolic diseases from cellular and molecular mechanisms involved in the development of metabolic risks to clinical practice Provides established guidelines that facilitate effective management of the independent risk factors that promote vascular diseases Discusses the use of diagnostic tools to empower patients to self monitor the progress or regress of modifiable risks     Obesity and Diabetes Mellitus E. I. Sokolov, 2020-08-14 This book is the result of the study of metabolic and hormonal disorders in patients suffering obesity and diabetes mellitus focusing on mechanisms of formation of atherosclerotic changes in the myocardium and vessels in diabetes mellitus patient

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