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CARDIOVASCULAR DISEASES: GLOBAL CHALLENGE AND SOLUTIONS

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ABSTRACT: Cardiovascular diseases (CVDs) are the leading cause of death worldwide, responsible for more than 17.9 million deaths each year. This article analyzes the main types of CVDs, risk factors, epidemiology, diagnostic and treatment approaches, modern strategies, and prevention measures. It also reviews the latest scientific research and innovative technologies aimed at reducing CVD prevalence.
KEYWORDS: Cardiovascular diseases, Ischemic heart disease, Myocardial infarction, Hypertension, Prevention, Cardiology, Risk factors, Telecardiology, Artificial intelligence, Statins, Rehabilitation

INTRODUCTION:

Cardiovascular diseases (CVDs) are a group of chronic and acute disorders affecting the heart and blood vessels.
These include ischemic heart disease (IHD), myocardial infarction, heart failure, arterial hypertension, stroke,
and peripheral artery disease. According to the WHO, CVDs account for 31% of global deaths.

EPIDEMIOLOGY:

- Global scale: Over 17.9 million deaths annually.
- High-risk regions: Asia and Africa have the highest mortality rates.
- Among youth: The number of cases is increasing in 35–45-year-olds.
- Uzbekistan data: CVDs are the leading cause of death, especially hypertension and heart failure.

RISK FACTORS:

1. Non-modifiable: age, gender, genetic predisposition.
2. Modifiable:
   - Smoking
   - Unhealthy diet (trans fats, high salt intake)
   - Physical inactivity
   - Obesity
   - Diabetes mellitus
   - Chronic stress

Research shows that controlling risk factors can prevent up to 80% of CVD-related deaths.

PATHOGENESIS:

Most CVDs are associated with atherosclerosis. Cholesterol plaques build up in the arterial wall, narrowing the vessel lumen,
disrupting blood flow, and eventually leading to thrombosis, myocardial infarction, or stroke.

DIAGNOSIS:

- Clinical examination: pulse, blood pressure, heart rhythm
- Laboratory tests: lipid profile, glucose, cardiac troponins
- Instrumental investigations:

- ECG
- Echocardiography
- Stress test
- Coronary angiography
- CT and MRI

TREATMENT:

The main goals are restoring blood flow, reducing cardiac workload, relieving symptoms, and preventing complications.

Pharmacological therapy:

- Antihypertensives: ACE inhibitors, beta-blockers
- Antithrombotics: aspirin, clopidogrel
- Statins: reduce cholesterol
- Diuretics: for heart failure

Interventional therapy:

- Stenting
- Coronary artery bypass grafting (CABG)
- Valve replacement

PREVENTION:

1. Primary prevention:
   - Healthy diet
   - At least 150 minutes of physical activity weekly
   - Smoking cessation
   - Blood pressure and glucose control
2. Secondary prevention:
   - Lifelong medication adherence
   - Rehabilitation programs
   - Lifestyle modification

INNOVATIONS:

- Telecardiology: remote ECG monitoring
- Artificial intelligence: early detection of CVDs
- Gene therapy and regenerative medicine: potential future treatment of myocardial damage

CONCLUSION:

CVDs remain a major global health problem. A comprehensive approach — risk factor control, early diagnosis,
modern treatment, and large-scale prevention — can significantly reduce mortality rates.

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