SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF NURSING AND WOMEN'S HEALTH
ISSN(Online): 2984-8083
Volume-9, Issue-02, Published |10-04-2026|

CARDIOVASCULAR DISEASE RISK DURING MENOPAUSE: PATHOPHYSIOLOGY, CLINICAL SIGNIFICANCE AND PREVENTION

Tillayeva Zarina Zafarbekovna
zarina_tillyayeva@tues.uz
https://orcid.org/0009-0000-9394-5326
Eshmatova Mahliyo Abdumalik qizi
Boyqobilova Yulduz Oltiboy qizi
Odiljonov Ozodbek Odiljonovich
Odiljonnorkulov0@gmail.com
https://orcid.org/0009-0000-4932-4354
Termez University of Economics and Service
Faculty of Medicine

ABSTRACT

Menopause represents a critical transition in a woman's life, characterized by the cessation of ovarian function and a decline in estrogen levels. This hormonal shift is strongly associated with an increased risk of cardiovascular diseases (CVD), which are the leading cause of mortality among women globally. The loss of estrogen's protective effects leads to metabolic changes, endothelial dysfunction, dyslipidemia, and increased arterial stiffness. This article explores the mechanisms underlying increased cardiovascular risk during menopause, evaluates epidemiological trends, and discusses diagnostic and preventive strategies. The findings emphasize the need for early risk assessment and targeted interventions in menopausal women.

Keywords: menopause, cardiovascular disease, estrogen deficiency, atherosclerosis, metabolic syndrome, hypertension

INTRODUCTION

Menopause is defined as the permanent cessation of menstruation due to ovarian follicular depletion, typically occurring between ages 45 and 55. According to the World Health Organization, cardiovascular diseases (CVD) are the leading cause of death among women worldwide.

Before menopause, women have a lower risk of CVD compared to men of the same age, largely due to the protective effects of estrogen. However, after menopause, this risk increases significantly and approaches or even exceeds that of men.

Key cardiovascular conditions associated with menopause include:

- Coronary artery disease
- Hypertension
- Atherosclerosis
- Stroke

Understanding the relationship between menopause and cardiovascular risk is essential for prevention and management.

MATERIALS AND METHODS

This article is based on a narrative review of scientific literature from PubMed, Scopus, and Web of Science.

Inclusion Criteria:

- Studies published between 2010 and 2024
- Women in perimenopausal and postmenopausal stages
- Studies addressing cardiovascular risk factors

Diagnostic Criteria:

- Menopause: ≥12 months of amenorrhea

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF NURSING AND WOMEN'S HEALTH
ISSN(Online): 2984-8083
Volume-9, Issue-02, Published |10-04-2026|

- CVD risk factors: hypertension, dyslipidemia, diabetes

RESULTS

1. Epidemiology of Cardiovascular Disease in Menopausal Women

Cardiovascular disease incidence increases sharply after menopause:

- Risk doubles within 10 years after menopause
- CVD accounts for ~35–40% of female deaths globally

2. Pathophysiological Mechanisms

a. Estrogen Deficiency

Estrogen has cardioprotective effects:

- Improves lipid profile
- Enhances endothelial function
- Reduces inflammation

After menopause:

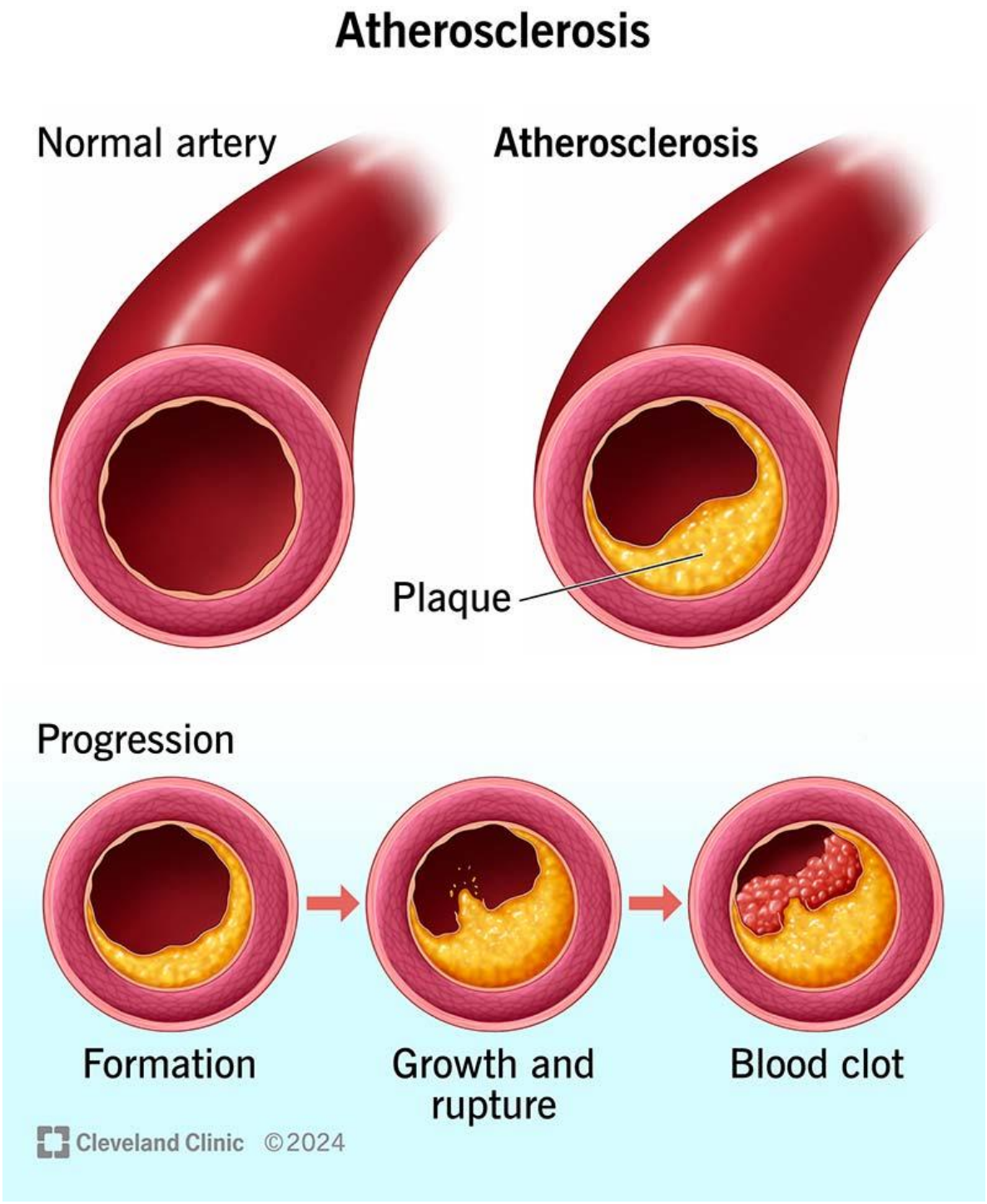
- LDL cholesterol increases
- HDL cholesterol decreases
- Vascular stiffness increases

b. Endothelial Dysfunction

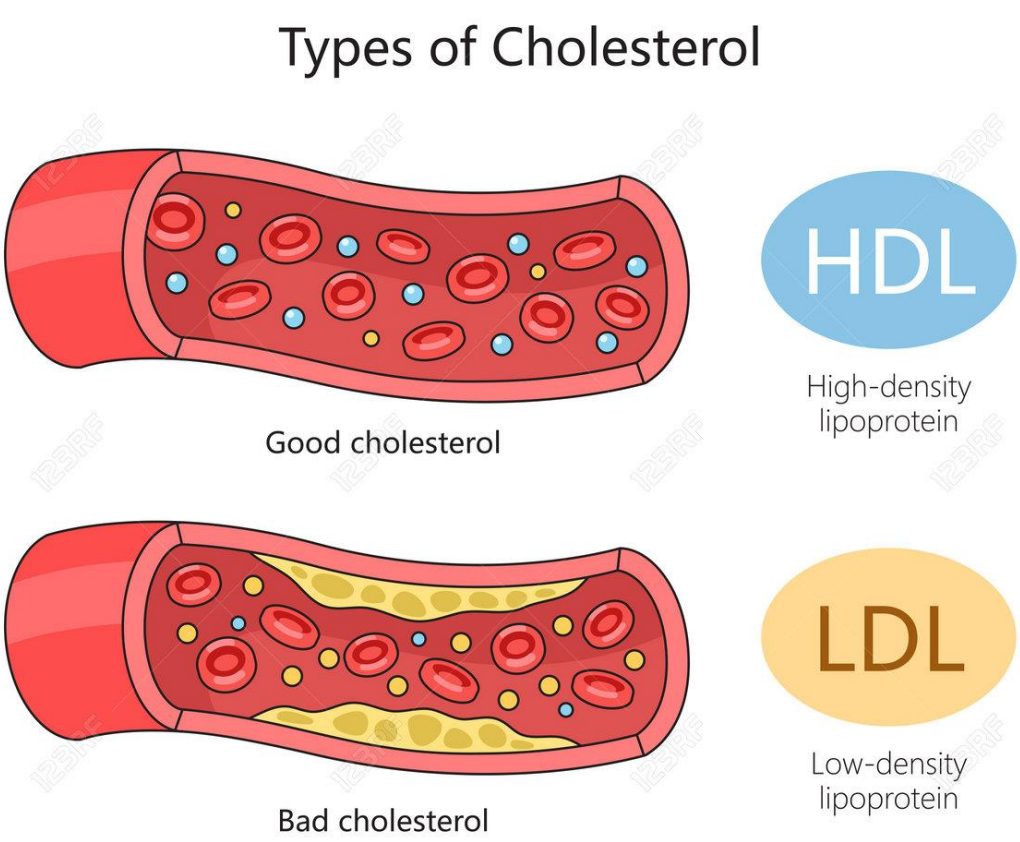
Estrogen promotes nitric oxide (NO) production, which maintains vascular tone. Its deficiency leads to:

- Reduced vasodilation
- Increased vascular resistance
- Atherosclerosis progression

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF NURSING AND WOMEN'S HEALTH
ISSN(Online): 2984-8083
Volume-9, Issue-02, Published |10-04-2026|



SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF NURSING AND WOMEN'S HEALTH
ISSN(Online): 2984-8083
Volume-9, Issue-02, Published |10-04-2026|



c. Metabolic Changes

Menopause is associated with:

- Central obesity
- Insulin resistance
- Dyslipidemia

These changes contribute to metabolic syndrome and increased CVD risk.

d. Inflammation and Oxidative Stress

Chronic low-grade inflammation increases during menopause, accelerating vascular damage and plaque formation.

3. Clinical Manifestations and Risk Factors

Major Risk Factors:

- Hypertension
- Hyperlipidemia
- Diabetes mellitus
- Smoking
- Sedentary lifestyle

Clinical Presentations:

- Chest pain (angina)
- Shortness of breath
- Fatigue

Women often present with atypical symptoms, leading to delayed diagnosis.

4. Diagnostic Approaches

Laboratory Tests:

- Lipid profile

JOURNAL OF NURSING AND WOMEN'S HEALTH
ISSN(Online): 2984-8083
Volume-9, Issue-02, Published |10-04-2026|

- Blood glucose
- Inflammatory markers

Imaging:

- ECG
- Echocardiography
- Coronary angiography

5. Prevention and Management

Lifestyle Modifications:

- Healthy diet
- Regular physical activity
- Weight management

Pharmacological Treatment:

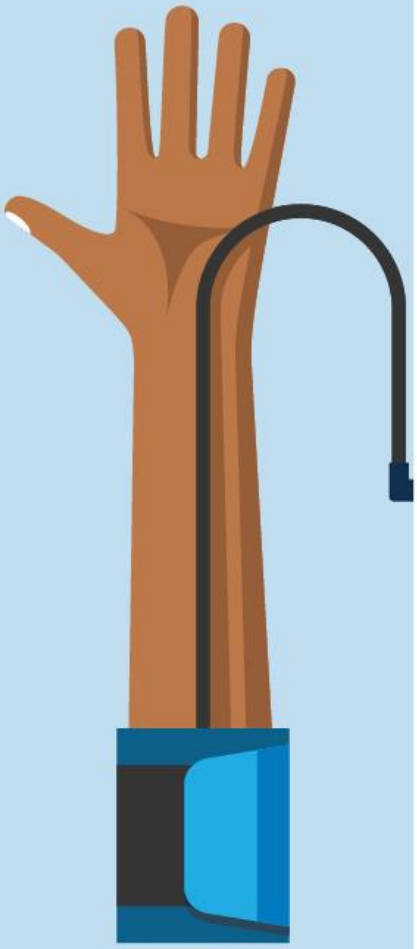
- Antihypertensives
- Statins
- Antidiabetic drugs

Hormone Replacement Therapy (HRT):

HRT may improve symptoms and metabolic profile but should be used cautiously due to potential risks.

SIR Publishers
CENTER FOR INTERNATIONAL SCIENTIFIC PUBLICATIONS
JOURNAL OF NURSING AND WOMEN'S HEALTH
ISSN(Online): 2984-8083
Volume-9, Issue-02, Published |10-04-2026|

5 Main Blood Pressure Ranges



180+ AND/OR 120+	Hypertensive Urgency or Emergency
140+ OR 90+	Stage 2 Hypertension
130-139 OR 80-89	Stage 1 Hypertension
120-129 AND <80	Elevated Blood Pressure
<120 AND <80	Normal Blood Pressure

Ranges are in **millimeters of mercury**

JOURNAL OF NURSING AND WOMEN'S HEALTH
ISSN(Online): 2984-8083
Volume-9, Issue-02, Published |10-04-2026|

DISCUSSION

The transition to menopause significantly increases cardiovascular risk due to hormonal and metabolic changes. Estrogen deficiency plays a central role in initiating vascular and metabolic alterations.

Early identification of high-risk individuals is essential. Preventive strategies should focus on lifestyle modification and appropriate medical therapy.

Multidisciplinary care involving cardiologists, endocrinologists, and gynecologists is recommended.

CONCLUSION

Menopause is a critical period associated with increased cardiovascular disease risk. Hormonal changes, metabolic disturbances, and endothelial dysfunction contribute to this risk. Early intervention, lifestyle changes, and targeted treatment can significantly reduce morbidity and mortality in menopausal women.

REFERENCES

1. World Health Organization (2021). *Cardiovascular disease in women report*.
2. Manson JE et al. (2013). Menopause and cardiovascular disease. *New England Journal of Medicine*.
3. Rossouw JE et al. (2002). Risks and benefits of HRT. *JAMA*.
4. North American Menopause Society (2020). Guidelines.
5. Mosca L et al. (2011). Cardiovascular prevention in women. *Circulation*.
6. El Khoudary SR et al. (2020). Menopause and CVD. *Lancet Diabetes & Endocrinology*
7. Mendelsohn ME, Karas RH. (2005). Estrogen effects. *NEJM*
8. Writing Group WHI (2002). Hormone therapy study
9. Yusuf S et al. (2001). Global risk factors. *Lancet*
10. Santen RJ et al. (2010). Hormone therapy review