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## **Omega-3 polyunsaturated fatty acids improve endothelial function in humans at risk for atherosclerosis: A Review**

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### **Highlights**

- Flow-mediated dilation (FMD) is a predictor of future atherosclerotic disease.
- Classic atherosclerosis risk factors impair FMD.
- Omega-3 polyunsaturated fatty acids improve FMD in those at-risk.
- Omega-3 polyunsaturated fatty acids also improve triglycerides in those at-risk.

### **Abstract**

Epidemiology studies and clinical trials show that omega-3 polyunsaturated fatty acids (n-3 PUFAs) can prevent atherosclerotic morbidity and evidence suggests this may be mediated by improving endothelial dysfunction. Endothelial dysfunction is characterized by reduced vasodilation and a pro-inflammatory, pro-thrombotic state, and is an early pathological event in the development of atherosclerosis. Flow-mediated dilation (FMD), a gold standard for assessing endothelial dysfunction, is a predictor of future cardiovascular events and coronary heart disease risk. Notably, risk factors for endothelial dysfunction include classic risk factors for atherosclerosis: Elevated lipids, diabetes, hypertension, elevated BMI, cigarette smoking, and metabolic syndrome. In this paper, we review the ability of n-3 PUFAs to improve endothelial dysfunction in individuals with classic risk factors for atherosclerosis, but lacking diagnosed atherosclerotic disease, with the goal of identifying those individuals that might gain the most vasoprotection from n-3 PUFA supplements. We include trials using eicosapentaenoic acid (EPA), docosahexaenoic acid (DHA), or alpha-linolenic acid (ALA) alone, or EPA+DHA; and assessing endothelial function by FMD, forearm blood flow, or peripheral arterial tonometry. We

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