

## **How smoking causes raised blood pressure and other circulation problems**

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The inner lining of arteries and veins is called 'ENDOTHELIUM' and this is like 'TEFLON' the non-stick surface on your cooking utensils! The 4000 chemicals in cigarettes are carried in the circulation around the body. These chemicals break down the non-stick endothelial lining of the blood vessel. When this non-stick lining of the blood vessel has been broken it leaves gaps and exposes the muscle beneath. Prolonged smoking leads to further muscle damage, and narrowing of the blood vessel.

15 minutes after a cigarette is smoked, the blood flow near the surface of the blood vessel is no longer smooth. White cells from the blood are clinging to the vessels wall; either rolling along it or completely stuck, some singly, some in clumps. This helps form an unwanted clot.

Smoking affects normal cholesterol. Cholesterol is divided into high-density lipoproteins (HDL), low-density lipoproteins (LDL) and very low-density lipoproteins (VDL). A higher ratio of HDL's to LDL's and VDL's may offer protection against heart disease. The ratios are reduced in those who smoke where the HDL's are lower thus increasing the risk of circulatory problems.

There is an added problem for smokers - carbon monoxide. Carbon monoxide is not usually present in blood. A percentage of a smoker's blood is made up of carbon monoxide, and is in direct proportion to the level of smoking. All blood flows through the right side of the heart and then to the lungs to be oxygenated where it is then returned to the left side of the heart and pumped around the body. The presence of carbon monoxide replaces oxygen in the cell.

To compensate for this the body creates extra red blood cells. This make the blood thicker and harder to pump which in turn make extra work on the heart and the whole circulation in general, thus pushing up the blood pressure. Smoker's plasma also has extra clotting protein making it thicker and permanently sticky. The endothelium is more than a non-stick surface. It holds the vessel wall open by keeping the muscle relaxed and repairing any damage as it occurs. *Nicotine restricts this normal mechanism.*

Nicotine whether delivered by cigarette or via NRT (e.g. patches, gum, microtabs, etc.) affects circulation. Nicotine travels through the bloodstream to the brain, and then is delivered to the rest of the body.

Nicotine alters a smoker's blood pressure, heart rate, and even their metabolism. Nicotine moves right into the lining of small blood vessels causing them to narrow thus reducing the blood flow to the organs in the body. Nicotine can inhibit the production of prostacyclin, a potent vasodilator and inhibitor of platelet aggregation, in arteries.