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## **Session 2:**

# **Heart & Blood Vessel Recovery**

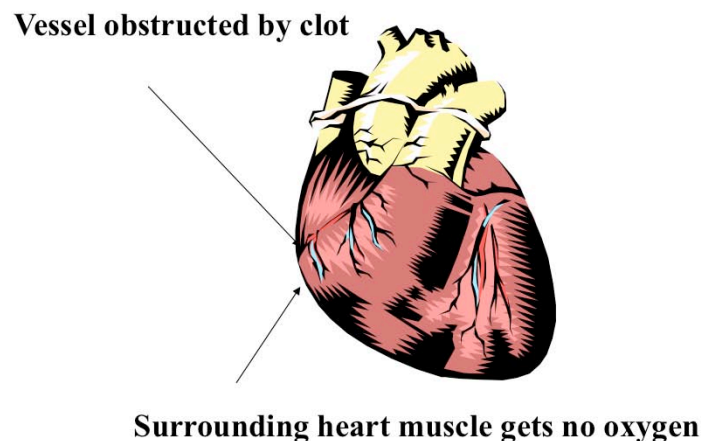
**Emphasize:** that smokers often believe that if they have been smoking for X number of years, it is going to take another X number of years to repair the damage that may have been done to the body.

**Emphasize:** that this is not necessarily the case. On quitting smoking, the body starts to repair almost immediately.

**In the session today, we are going to discuss the repair and recovery that occurs in the circulatory system.**

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## What is a heart attack?



**Describe:** the structure and function of the circulatory system.

**Describe:** the structure and function of the coronary arteries.

**Emphasize:** the importance of all blood vessels, especially the coronary arteries being patent.

**Explain:** the concept of blood pressure.

**Advise:** inhaled nicotine via smoking causes blood vessels all over the body to constrict to approx. 1/3 of their diameter and this is called vasoconstriction.

**Advise:** this is an immediate effect from smoking and occurs literally while you are smoking. It lasts for approx. 30 mins.

**Pose the Question:** What effect would that have on the body?

**Consider risks for:** heart disease, stroke and peripheral vascular

**Explain effects on:** blood pressure, fitness and skin integrity (wrinkles).

**Consider:** risks for younger smokers if they have yet to develop collateral circulation.

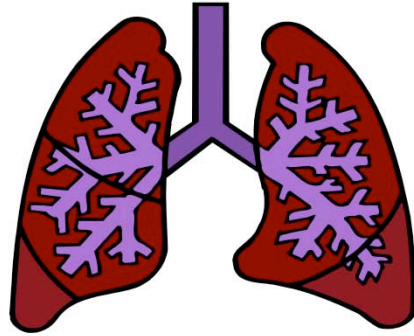
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## REVERSABILITY?

- Vasoconstriction effect approx. 30 mins.
- Then: **vasodilate**
- ↑ Oxygen to all major organs
- ↓ Risks of:
  - Heart attack
  - Stroke
  - Peripheral vascular disease.
- ↑ Fitness
- Skin integrity improves

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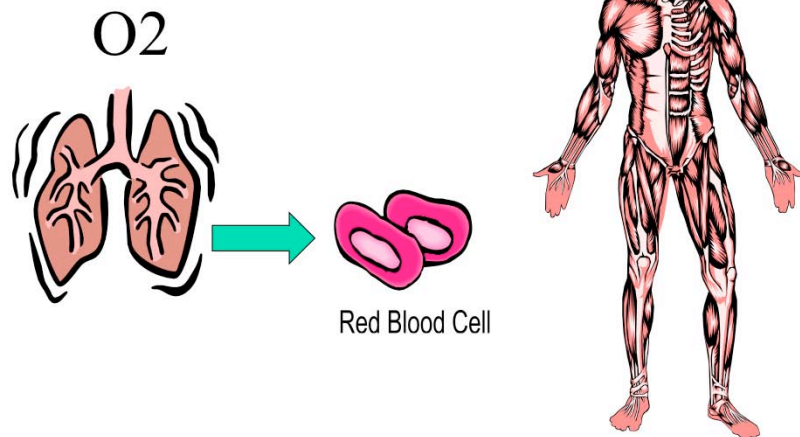
The lung is like a tree .....



**Advise: another chemical in tobacco which damages the heart and blood vessels is Carbon Monoxide (CO). In order to understand what Carbon Monoxide does, we need to understand how the lungs and respiratory system work.**

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Oxygen enters the body via the  
lungs

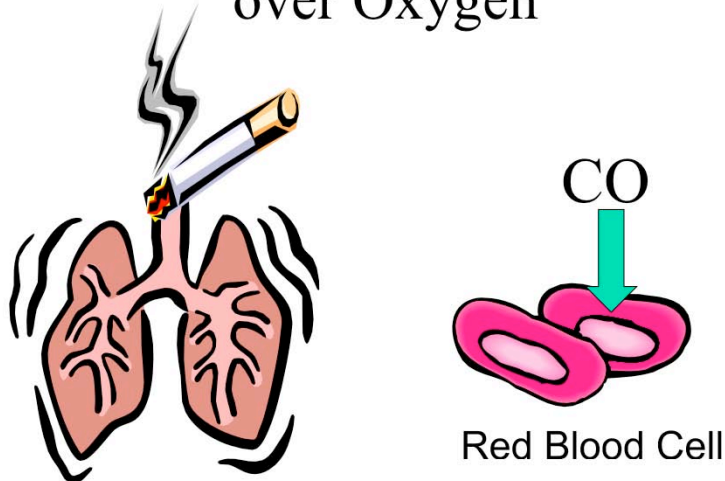


**Explain: Structure and function of the respiratory system.**

**Relate: the respiratory system to the cardiovascular system.**

**Emphasize: the importance of red blood cells transporting oxygen to the tissues of the body.**

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When you smoke Carbon  
Monoxide (CO) takes preference  
over Oxygen



**Explain:** the combustion of organic material and the production of CO.

**Emphasize:** that CO is a very dangerous, colourless, odourless gas.

**Explain:** how burning a cigarette produces CO which enters the lungs via the respiratory tree. Carbon monoxide then competes with oxygen for the site of the red cell. The red cell seems to have a preference for CO over O<sub>2</sub> by about 217 times.

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The red cell fills with Carbon Monoxide which stays there



Red Blood Cell

**Explain:** Smokers circulate red blood cells carrying CO.

**Pose the question to the patient:** What effect might this have in the body?

**Emphasize:** lack of oxygen transport and its effect on all body areas.

**Emphasize:** the effects on the heart, blood vessels and the brain.

**Discuss:** secondary polycythemia using the analogy of a “traffic jam” to explain changes in blood flow, viscosity and the possibility of thrombosis.

**Advise:** that 30% carboxyhaemoglobin is fatal and that smokers have carboxyhaemoglobin concentrations of 10-15%.

**Stress:** the combined effects of CO, carboxyhaemoglobin and vasoconstriction.

**Emphasise:** that red blood cells bind to CO very strongly. The bond continues for the full life of the red cell which is 120 days (4 months).

**Advise:** as a smoker, you end up very poorly oxygenated for this time period.

**Compare:** the carboxyhaemoglobin from smoking to house fires (smoke inhalation) and to car exhaust fumes.

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The same day no Carbon  
Monoxide enters your lungs  
(when you stop smoking)  
Oxygen can enter new red cells  
again!



Red Blood Cell

**Advise:** when you quit smoking, because you stop burning and inhaling, you stop breathing in CO gas from smoking.

**Emphasize:** more red cell availability for oxygen, that every day red cells die and at the same time release carbon monoxide.

**Explain** that the compensatory mechanism of polycythemia starts to reverse.

**Explain** the ramifications of this on blood viscosity, thrombosis and general flow.

**Relate:** the gradual reversibility of secondary polycythemia to risk for heart disease, stroke and peripheral vascular disease. Also relate it to skin integrity, healing fitness and cosmetic factors.

**State:** every day you don't smoke, your blood stream is thinning.

**State:** by 4 months of not smoking, your carbon monoxide level is similar to someone who has never smoked.

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## **CONCLUSION**

- There is a lot of recovery which occurs in the heart and blood vessels on quitting smoking.
- Blood vessels, including the coronary arteries dilate within 30 minutes of having the last cigarette.
- Four months after quitting all CO from smoking has been cleared from the bloodstream.

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- **The nett effect is that the body is much better oxygenated so that the risk of heart attack, stroke, peripheral vascular disease (with gangrene) is reduced.**
- **Fitness and general complexion (appearance) improves.**

