Cadmium

There is a plethora of research surrounding the toxicological and carcinogenic profile of Cadmium. A very recent (2008) profile titled 'Draft toxicological profile for Cadmium' has been documented by the Agency for Toxic Substances and Disease Registry and is listed under our 'Medical Director Review'. http://www.examinetics.com/ProfessionalResources/CadmiumExposure/

Humans normally absorb cadmium into the body either by ingestion or inhalation. The absorption of cadmium from the lungs is much more effective than that from the gut.

Much of the cadmium which enters the body by ingestion comes from terrestrial foods. This is to say, from plants grown in soil or meat from animals which have ingested plants grown in soil. Thus, directly or indirectly, it is the cadmium present in the soil and the transfer of this cadmium to food plants together with the cadmium deposited out of the atmosphere on edible plant parts which establishes the vast majority of human cadmium intake. 98% of the *ingested* cadmium comes from terrestrial foods, while only 1% comes from aquatic foods such as fish and shellfish, and 1% arises from cadmium in drinking water (Van Assche 1998). It is widely accepted (WHO 1992, ATSDR 1997) that approximately 1% of cadmium comes from ingestion and 2% to 6% of the cadmium *ingested* is actually taken up into the body.

Tobacco smoking is the most important single source of cadmium exposure in the general population. Tobacco leaves are known to bio-accumulate the cadmium. It has been estimated that about 10% of the cadmium content of a cigarette is inhaled through smoking. In contrast to ingestion, a smoker intakes roughly 50% of their cadmium from cigarettes. Of that inhaled 50%, 30% to 64% of the cadmium is absorbed by the body. Thus, a greater proportion of *inhaled* cadmium is retained by the body than when cadmium is taken in by *ingestion*.

Acute inhalation of Cadmium causes damage to the lungs and respiratory conditions such as respiratory edema and can eventually lead to respiratory failure and death. If low levels of cadmium are inhaled or ingested over a long period of time, the chemical is known to accumulate in the kidney and cause kidney damage and disease. On average, smokers have 4-5 times higher blood cadmium concentrations and 2-3 times higher kidney cadmium concentrations than non-smokers. Despite the high cadmium content in cigarette smoke, there seems to be little exposure to cadmium from passive smoking (2nd hand smoke). No significant effect on blood cadmium concentrations could be detected in children exposed to environmental tobacco smoke.

Cadmium is known to accumulate in the human kidney for a relatively long time, from 20 to 30 years, and, at high doses, is also known to produce health effects on the respiratory system and has been associated with bone disease.

Jarup, L. (1998). "Health effects of cadmium exposure—a review of the literature and a risk estimate". *Scandinavian Journal of Work, Environment and Health* **24**: 11–51.

http://www.examinetics.com/ProfessionalResources/CadmiumExposure/

http://www.cadmium.org/env_exp.html