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A short summary of a history about elementary mercury
Elementary Mercury CAS # 7439-97-6

Concomitant exposure to Hg vapour and chlorine gas reduces the absorption of Hg vapour and also alters its distribution within the body, resulting in lowered toxicity of Hg vapour when in the presence of chlorine (Viola and Cassano, 1968). Therefore, the exposure response relations reported in chloralkali workers may be confounded (reduced) by concomitant exposure to both Hg vapour and chlorine.

It should be kept in mind that metallic mercury (mercury vapour) leads to adverse effects also in dental personnel; sensitive dental personnel may include pregnant women, children, personnel with impaired kidney function and personnel with hypersensitive immune responses to metals.

Elemental mercury can enter the body by absorption through the skin, by absorption through the stomach if swallowed, or by inhalation.
When mercury vapour is inhaled, the lung is the main site of absorption. Approximately 80% of the inhaled vapour enters the bloodstream and is rapidly transported to other parts of the body, including the brain and kidneys. It readily crosses the blood-brain and placental barriers. Elemental mercury, in the blood of pregnant women, may be passed on to the developing foetus.

In 1994 Professor Dr. Gustav Drasch, Institute of Forensic Medicine of the University of Munich, conducted a research study that measured the mercury content of the kidneys, liver and brain tissue of deceased foetuses, newborn and young children. The mercury levels in the deceased foetuses correlated directly to the amount of dental amalgams in the teeth of the mothers. These results clearly demonstrated that the mercury from the dental amalgams of mothers is inherited by their offspring.

In 1993 Degussa AG, Germany's largest producer of dental amalgam, announced that it would no longer provide the product.

An example of a 'protective policy' damaging to women was the so called 'foetal protection' policy adopted by some North American industries in the 1980s, whereby women of reproductive age were given the option of either sterilization or unemployment. The US Supreme Court put an end to this discriminatory practice on the basis of the legal and ethical principle that the workplace should be safe for all workers, including pregnant women.

In 1987, the Federal Department of Health (GBA) of the German government issued an advisory warning against the use of dental amalgam in pregnant women, and BGA issued a document further restricting the use of amalgam, including the high-copper amalgam, Non-gamma2-amalgam.

In order to obtain a comprehensive picture of the danger of mercury poisoning in odontological work it is necessary to study the problem from the point view of occupational hygiene and to consider in detail how mercury is handled in a dental surgery.
In the 1926 a German chemist Alfred Stock warned against using mercurial amalgam. Stock was himself ill from a slowly insidious mercurial poisoning.

In 1928 Alfred Stock warned against copper amalgam. He also referred to a paper by Professor Fleischmann, who described a number of cases of amalgam-related illness in which removal of amalgam had led to complete recovery (Deutsche medizinische Wochenschrift 1928, No. 8).

Alfred Stock's symptoms

First stage:
Reduced capacity to work, irritation, swelling in the mucous membrane in the upper area of the nose cavity, mental agitation.

Second stage:
Extreme tiredness, reduced concentration, bad memory for numbers and names, irritation, capricious, the feeling of being "stupid", blocked nose with dryness, nose secretion viscous and at times bloody, ringing in ears, headache (often in forehead), bleeding gums when brushing teeth, irregular heart activity, periodical diarrhoea, had to go often to the toilet, slight trembling.

Karl O. Frykholm, Department of Operative Dentistry (Head: Professor Gösta Westin)
The Royal School of Dentistry, Stockholm. In 1956, Frykholm did a research study showing that after dental nurses heated up copper amalgam in an open spoon over a flame, the mercury vapour in the air rose to 3000mg Hg/m3, measured about 10cm above the spoon.

Professor of Neurology Tore Patrick Störtebecker MD, Oslo, Norway.
In 1961 wrote Diseases of the Nervous System and Mercury Vapour. Mercury pathway may be directly by the cranial venous system to the brain.

The Nordic Institute for Odontological Board of Examiners, NIOM, in Oslo, Norway, conducted a research study to show that copper amalgam and Neo-Silbrin were leaking mercury and sometimes cadmium to an extent where children could be subjected to toxic levels. Cupromuc consists of approximately 70% mercury, 29% copper and the rest cadmium. Copper amalgam is not regulated in any ISO-standard.

Comments to the SCENIHR preliminary report 'The safety of dental amalgam and alternative dental restoration materials for patients and users'.

Page 4: 'No studies have shown that dental personnel suffer classical signs of mercury intoxication'. This is the observation made by the SCENIHR.

Comments: This observation is not adequate to use.

1. Radizislaw Sikorski et al. (1987), Women in dental surgeries: reproductive hazards in occupational exposure to metallic mercury. Clinic of Gynaecology, Int Arch Occup Environ Health, 59:551-557, Springer-Verlag.
The relation between TMLs in the scalp hair and the prevalence of menstrual cycle disorders was statistically significant. These findings indicate that dental work could be another occupational hazard with respect to reproductive processes.

2. Rowland et al., 1994
Dental assistants in California with high occupational exposure to mercury were less fertile than unexposed controls.
Epidemiology Branch, National Institute of Environmental Health Sciences, Research TRIANGLE park, NC 27709
http://oem.bmj.com/cgi/content/abstract/51/1/28

3. Professor Linda Jones (2007), A 30-year follow-up of Residual Effects on New Zealand School Dental Nurses, from occupational mercury exposure. Human & Experimental Toxicology, 26:367-374, www.sagepublications.com
Dr. Jones said: 'dental nurses who had mixed the amalgam by hand before the practice was stopped in 1974 had a far higher rate of needing hysterectomies than the general population of women, as well as other troubles'.

4. Hofmann
Zahnärztliche Mitteilungen (1951), No 4/51,9. 104.
Eine zahnärztliche Helferin ist vor kurzem an Queksilbervergiftung gestorben. In ihrer Eigenschaft als zahn ärztliche Helferin hatte sie auch mit Amalgam zu arbeiten.

Translation from Zahnärztliche Mitteilungen 1951 (German:, Dental Communications)
No 4/51, p. 104
Association for Health and Welfare
A dental assistant recently died from mercury poisoning. Her work as a dental assistant involved the handling of dental amalgam.

5. Cook TA, Yates Po (1969), British Dental Journal, 127:553-5 (12/16769).
Professor Per Løkken (1971), Nor Tannlegetidende 81, 275-88.
A 42-year-old dental surgery assistant with at least a 20-year history of exposure to mercury developed a rapidly fatal nephritic syndrome. The high levels of mercury in the kidney estimated by neutron activation analysis and demonstrated historically that this was the result of mercury intoxication.

6. 'The Surrey Incident'. Four cases of mercury intoxication.
D.P.Merfield et al. (1976), Brit.dent. J., 141, 179. Mercury intoxication in a dental surgery following unreported spillage. An unreported spillage of mercury in a dental surgery.
A dental surgery assistant spilled mercury from a plastic container into the mercury mechanical amalgamator. Two dentists and one dental surgery assistant had clinical symptoms of mercury intoxication after inhalation of mercury vapour. One dental surgery assistant died of mercury intoxication.