The fluoride debate
Part 2

The second of a two-part article, by **Dr Mike Godfrey**. Part one was published in *Organic NZ* Nov/Dec 2014.

Water fluoridation uses hexafluorosilicic acid (H_2SiF_6) and its sodium salt (NaSiF) almost exclusively. These are not pure, but recovered in crude form by scrubbing the chimneys of super-phosphate and aluminium factories. These chemicals are contaminated with variable amounts of lead, arsenic, beryllium, vanadium, cadmium, and mercury. Therefore, because of the different chemicals used, old studies based on natural calcium fluoride are irrelevant. Calcium binding firmly to fluoride does lessen the body's uptake of the latter, but the fluoride used in water fluoridation doesn't contain calcium.
Disposal of the highly toxic and corrosive silicofluoride wastes from the chimneys was a major problem until approval was orchestrated in the USA to permit dilution into municipal water supplies in the 1940s and 50s (Kauffman 2005). Ironically, the cost of fertiliser could well significantly increase if this corrosive waste product had to be stored.

Lack of safety testing
These silicofluorides have never been tested for safety yet they have, by definition, been used for a therapeutic purpose (Section 4 Medicines Act 1981) to purportedly reduce dental decay for the past decades in the USA, Australia, New Zealand and the Republic of Ireland – with the latter having had 50 years of mandated water fluoridation. The RoI population at 4.5 million is comparable to New Zealand. Both countries also generally have soft water supplies with low calcium levels that increase fluoride sensitivities and potential toxicity. Because fluoride has also been extensively used by both the pharmaceutical and chemical industries to increase the potential activity of other substances, the potential for synergistic effects with the known contaminants appears logical and plausible.

Health effects
It is therefore a moot point whether these reported adverse health effects are due to sodium fluoride, silicofluoride compounds (such as aluminofluoride) or in addition, an enhanced deleterious effect of fluoride when combined with arsenic, a confirmed carcinogen. The deliberate addition of arsenic to water supplies – however diluted – would not normally be tolerated. However, chronic exposures to even sodium fluoride may cause damage to kidneys, lungs, the nervous system, heart, gastrointestinal tract, cardiovascular system, bones and teeth **(**2008 MSDS – Material Safety Data Sheet – Sodium fluoride NaF 100% – www.sciencelab.com/msds.php?msdsId=9927595, Science Lab.com, Texas. Accessed July 2013**)**.
Fluoride is the lightest and most bioactive of the halogens (fluorine, chlorine, bromine and iodine) and as such will adversely compete with iodine uptake. As the majority of our population is already iodine (and selenium) deficient, further depletion will have potentially serious adverse health effects, not only on the thyroid but also on the breasts, with subsequent risks of fibrocystic breast disease (FBD) and cancer. Notably, daily high-dose iodine supplementation is an effective treatment for FBD.
A physiological review of fluoridation was recently published that, while also demolishing the purported benefit theory, revealed widespread adverse effects including serious cardiovascular adverse events due to fluoride-induced hypocalcaemia (Sauerheber 2013). Support for adverse cardiovascular effects also appeared in a 2012 paper that concluded 'An increased fluoride uptake in coronary arteries may be associated with an increased

cardiovascular risk' (Li et al., 2012). According to Sauerheber, industrial fluoride at blood levels typically found in residents of fluoridated cities is recognised as a neurotoxin, a non-physiologic mitogen, a general enzyme inhibitor, and a permanent bone perturbant during chronic consumption.

Minimal reduction in dental decay

In contrast to these potential adverse effects, the much claimed and impressive 25 percent reduction in dental decay from fluoride is, in real terms, a reduction of less than one dental surface of a child's 128 dental surfaces. This fact has been repeatedly shown in American and Australian dental research aimed at confirming fluoride benefits: Brunelle and Carlos, 1990 (0.6 surface); Spencer AJ and Slade, 1996 (0.3 surface); and Armfield and Spencer, 2004 (1.5 surfaces). Furthermore, the latest findings (Slade and Spencer 2013) on lifelong (45 years) exposure in Australia had a maximum benefit of one tooth saved with reportedly questionable statistical relevance. Notwithstanding these miniscule reductions, a percentage is used to give the impression of sufficient benefit.

Dietary link with dental caries

During the 1950–60s Ralph Steinman, Professor of Dentistry at Loma Linda University, California, published over 20 primary animal research papers. He was the co-discoverer of the hypothalamic-parotid endocrine axis that controls the rate of fluid movement through the dentine (Steinman and Leonora 1968). Steinman proved that dental caries mainly resulted from chronically elevated levels of sugars in the blood. Systemic sucrose resulted in the normal caries-protective retrograde dentinal fluid movement (back-flushing) ceasing and even reversing. This reversal facilitated bacterial invasion of the several kilometres of dentinal tubules per tooth. Physiological failure therefore preceded structural failure that Steinman also showed occurring in the dentine prior to enamel breakdown (Steinman 1971). The fluoride-hardened enamel merely delays caries detection that then occurs in the young adult with unexpected and significant financial costs.

Dental caries therefore appears to be a systemic disease that is eminently controllable by diet and not a fluoride-deficiency condition. Notably, the Maori population on their ancestral diet and drinking 'fluoride-deficient' waters had negligible decay until they included white flour and sugar. The caries incidence then increased to 40 per cent within a generation (Price 2010). A 1.5-litre bottle of cola in a supermarket that some children drink on a daily basis is cheaper than bottled water but contains about 40 teaspoons of sugar.

Michael Godfrey (MBBS) founded the Bay of Plenty Environmental Health Clinic in Tauranga.

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