



**FLUORIDEALERT.ORG**  
Fluoride Action Network

# 50 REASONS TO OPPOSE FLUORIDATION

Written by

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**"The evidence that  
fluoridation is more  
harmful than beneficial  
is now overwhelming."**

Dr. Hardy Limeback

Former President of the Canadian  
Association for Dental Research.

**"Fluoridation goes  
against all principles  
of pharmacology.  
It's obsolete."**

Dr. Arvid Carlsson

Nobel Laureate in Medicine/Physiology.

**"In summary, we hold  
that fluoridation is  
an unreasonable risk."**

U.S. Environmental Protection Agency's  
Headquarters Union of Scientists  
and Professionals (2001)

UPDATED AUGUST, 2012

Fluoridation is the practice of adding a fluoride compound to the public drinking water supply ostensibly for the purpose of fighting tooth decay. The levels used range from 0.6 to 1.2 milligrams of fluoride ion per liter. The practice began in the United States in 1945 and was endorsed by most U.S. medical and dental associations shortly thereafter. Very few countries, however, have adopted the practice to any significant extent. Only eleven countries in the world have more than 50% of their populations drinking artificially fluoridated water (Australia, Brunei, Chile, Hong Kong, Ireland, Israel, Guyana, Malaysia, New Zealand, Singapore, and the United States).

In Europe, only Ireland (73%), Poland (1%), Serbia (3%), Spain (11%), and the U.K. (11%) fluoridate any of their water. Most developed countries, including Japan and 97% of the western European population, do not consume fluoridated water.

In the U.S., about 70% of public water supplies are fluoridated. This equates to approximately 185 million people, which is over half the number of people drinking artificially fluoridated water worldwide. Some countries have areas with high natural fluoride levels in the water. These include India, China and parts of Africa. In these countries measures are being taken to remove the fluoride because of the health problems that fluoride can cause.

**"WE'VE GONE WITH THE STATUS QUO REGARDING FLUORIDE FOR MANY YEARS—FOR TOO LONG, REALLY—AND NOW WE NEED TO TAKE A FRESH LOOK. IN THE SCIENTIFIC COMMUNITY, PEOPLE TEND TO THINK THIS IS SETTLED. BUT WHEN WE LOOKED AT THE STUDIES THAT HAVE BEEN DONE, WE FOUND THAT MANY OF THESE QUESTIONS ARE UNSETTLED AND WE HAVE MUCH LESS INFORMATION THAN WE SHOULD, CONSIDERING HOW LONG THIS HAS BEEN GOING ON."**

Dr. John Doull

CHAIRMAN, NATIONAL RESEARCH COUNCIL'S REVIEW ON FLUORIDE IN DRINKING WATER.

## **FLUORIDATION IS A BAD MEDICAL PRACTICE**

### **1) FLUORIDE IS THE ONLY CHEMICAL ADDED TO WATER FOR THE PURPOSE OF MEDICAL TREATMENT.**

The U.S. Food and Drug Administration (FDA) classifies fluoride as a drug when used to prevent or mitigate disease (FDA 2000). As a matter of basic logic, adding fluoride to water for the sole purpose of preventing tooth decay (a non-waterborne disease) is a form of medical treatment. All other water treatment chemicals are added to improve the water's quality or safety, which fluoride does not do.

### **2) FLUORIDATION IS UNETHICAL.**

Informed consent is standard practice for all medication, and one of the key reasons why most of Western Europe has ruled against fluoridation. With water fluoridation we are allowing governments to do to whole communities (forcing people to take a medicine irrespective of their consent) what individual doctors cannot do to individual patients.

Put another way: Does a voter have the right to require that their neighbor ingest a certain medication (even if it is against that neighbor's will)?

### **3) THE DOSE CANNOT BE CONTROLLED.**

Once fluoride is put in the water it is impossible to control the dose each individual receives because people drink different amounts of water. Being able to control the dose a patient receives is critical. Some people (e.g., manual laborers, athletes, diabetics, and people with kidney disease) drink substantially more water than others.

### **4) THE FLUORIDE GOES TO EVERYONE REGARDLESS OF AGE, HEALTH OR VULNERABILITY.**

According to Dr. Arvid Carlsson, the 2000 Nobel Laureate in Medicine and Physiology and one of the scientists who helped keep fluoridation out of Sweden:

*“Water fluoridation goes against leading principles of pharmacotherapy, which is progressing from a stereotyped medication — of the type 1 tablet 3 times a day — to a much more individualized therapy as regards both dosage and selection of drugs.*

*The addition of drugs to the drinking water means exactly the opposite of an individualized therapy” (Carlsson 1978).*

## **5) PEOPLE NOW RECEIVE FLUORIDE FROM MANY OTHER SOURCES BESIDES WATER.**

Fluoridated water is not the only way people are exposed to fluoride. Other sources of fluoride include food and beverages processed with fluoridated water (Kiritsy 1996; Heilman 1999), fluoridated dental products (Bentley 1999; Levy 1999), mechanically deboned meat (Fein 2001), tea (Levy 1999), and pesticide residues (e.g., from cryolite) on food (Stannard 1991; Burgstahler 1997). It is now widely acknowledged that exposure to non-water sources of fluoride has significantly increased since the water fluoridation program first began (NRC 2006).

## **6) FLUORIDE IS NOT AN ESSENTIAL NUTRIENT.**

No disease, not even tooth decay, is caused by a “fluoride deficiency” (NRC 1993; Institute of Medicine 1997, NRC 2006). Not a single biological process has been shown to require fluoride. On the contrary there is extensive evidence that fluoride can interfere with many important biological processes. Fluoride interferes with numerous enzymes (Waldbott 1978). In combination with aluminum, fluoride interferes with G-proteins (Bigay 1985, 1987). Such interactions give aluminum-fluoride complexes the potential to interfere with signals from growth factors, hormones and neurotransmitters (Strunecka & Patocka 1999; Li 2003). More and more studies indicate that fluoride can interfere with biochemistry in fundamental ways (Barbier 2010).

## **7) THE LEVEL IN MOTHERS’ MILK IS VERY LOW.**

Considering reason #6 it is perhaps not surprising that the level of fluoride in mother’s milk is remarkably low (0.004 ppm, NRC, 2006). This means that a bottle-fed baby consuming fluoridated water (0.6 – 1.2 ppm) can get up to 300 times more fluoride than a breast-fed baby. There are no benefits (see reasons #11-19), only risks (see reasons #21-36), for infants ingesting this heightened level of fluoride at such an early age (an age where susceptibility to environmental toxins is particularly high).

**8 ) FLUORIDE ACCUMULATES IN THE BODY.**

Healthy adult kidneys excrete 50 to 60% of the fluoride they ingest each day (Marier & Rose 1971). The remainder accumulates in the body, largely in calcifying tissues such as the bones and pineal gland (Luke 1997, 2001). Infants and children excrete less fluoride from their kidneys and take up to 80% of ingested fluoride into their bones (Ekstrand 1994). The fluoride concentration in bone steadily increases over a lifetime (NRC 2006).

**9) NO HEALTH AGENCY IN FLUORIDATED COUNTRIES IS MONITORING FLUORIDE EXPOSURE OR SIDE EFFECTS.**

No regular measurements are being made of the levels of fluoride in urine, blood, bones, hair, or nails of either the general population or sensitive subparts of the population (e.g., individuals with kidney disease).

**10) THERE HAS NEVER BEEN A SINGLE RANDOMIZED CLINICAL TRIAL TO DEMONSTRATE FLUORIDATION'S EFFECTIVENESS OR SAFETY.**

Despite the fact that fluoride has been added to community water supplies for over 60 years, "there have been no randomized trials of water fluoridation" (Cheng 2007). Randomized studies are the standard method for determining the safety and effectiveness of any purportedly beneficial medical treatment. In 2000, the British Government's "York Review" could not give a single fluoridation trial a Grade A classification – despite 50 years of research (McDonagh 2000). The U.S. Food and Drug Administration (FDA) continues to classify fluoride as an "unapproved new drug."

**SWALLOWING FLUORIDE PROVIDES NO (OR VERY LITTLE) BENEFIT**

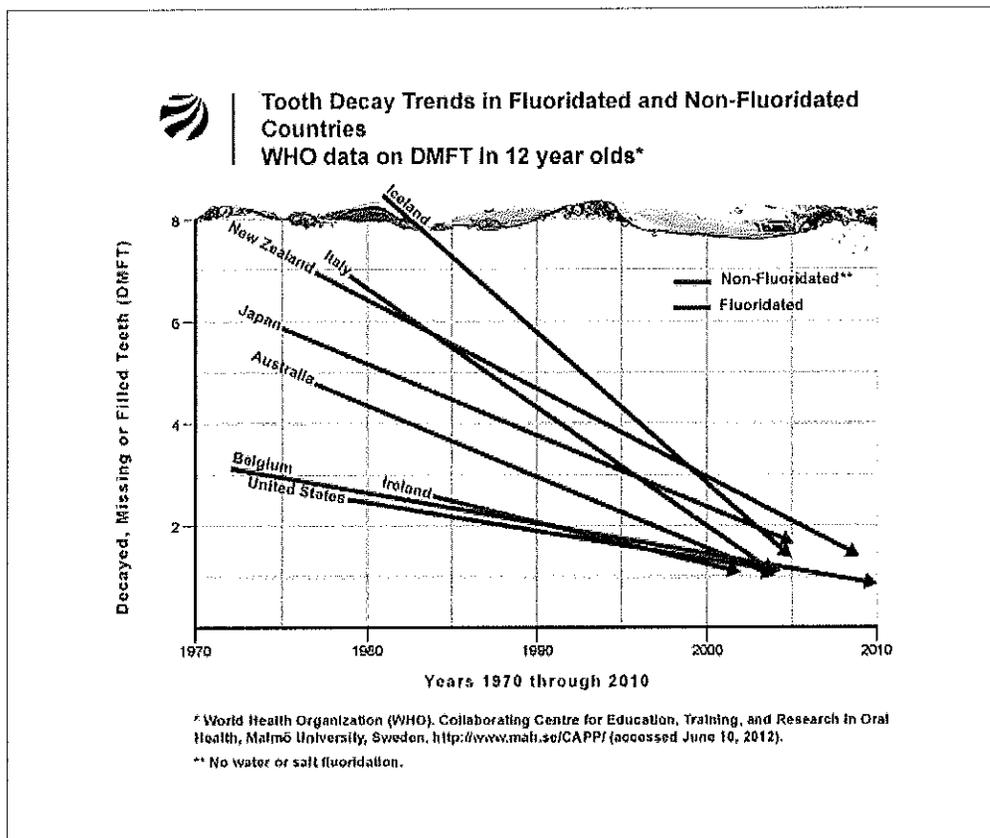
**11) BENEFIT IS TOPICAL NOT SYSTEMIC. THE CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC, 1999, 2001) HAS NOW ACKNOWLEDGED THAT THE MECHANISM OF FLUORIDE'S BENEFITS ARE MAINLY TOPICAL, NOT SYSTEMIC.**

There is no need whatsoever, therefore, to swallow fluoride to protect teeth. Since the purported benefit of fluoride is topical, and the risks are systemic, it makes more sense to deliver the fluoride directly to the tooth in the form of toothpaste.

Since swallowing fluoride is unnecessary, and potentially dangerous, there is no justification for forcing people (against their will) to ingest fluoride through their water supply.

## 12) FLUORIDATION IS NOT NECESSARY.

Most western, industrialized countries have rejected water fluoridation, but have nevertheless experienced the same decline in childhood dental decay as fluoridated countries. (See data from World Health Organization presented graphically in Figure).



**13) FLUORIDATION'S ROLE IN THE DECLINE OF TOOTH DECAY IS IN SERIOUS DOUBT.**

The largest survey ever conducted in the US (over 39,000 children from 84 communities) by the National Institute of Dental Research showed little difference in tooth decay among children in fluoridated and non-fluoridated communities (Hileman 1989). According to NIDR researchers, the study found an average difference of only 0.6 DMFS (Decayed, Missing, and Filled Surfaces) in the permanent teeth of children aged 5-17 residing their entire lives in either fluoridated or unfluoridated areas (Brunelle & Carlos, 1990). This difference is less than one tooth surface, and less than 1% of the 100+ tooth surfaces available in a child's mouth. Large surveys from three Australian states have found even less of a benefit, with decay reductions ranging from 0 to 0.3 of one permanent tooth surface (Spencer 1996; Armfield & Spencer 2004). None of these studies have allowed for the possible delayed eruption of the teeth that may be caused by exposure to fluoride, for which there is some evidence (Komarek 2005). A one-year delay in eruption of the permanent teeth would eliminate the very small benefit recorded in these modern studies.

**14) NIH-FUNDED STUDY ON INDIVIDUAL FLUORIDE INGESTION AND TOOTH DECAY FOUND NO SIGNIFICANT CORRELATION.**

A multi-million dollar, U.S. National Institutes of Health (NIH)-funded study found no significant relationship between tooth decay and fluoride intake among children (Warren 2009). This is the first time tooth decay has been investigated as a function of individual exposure (as opposed to mere residence in a fluoridated community).

**15) TOOTH DECAY IS HIGH IN LOW-INCOME COMMUNITIES THAT HAVE BEEN FLUORIDATED FOR YEARS.**

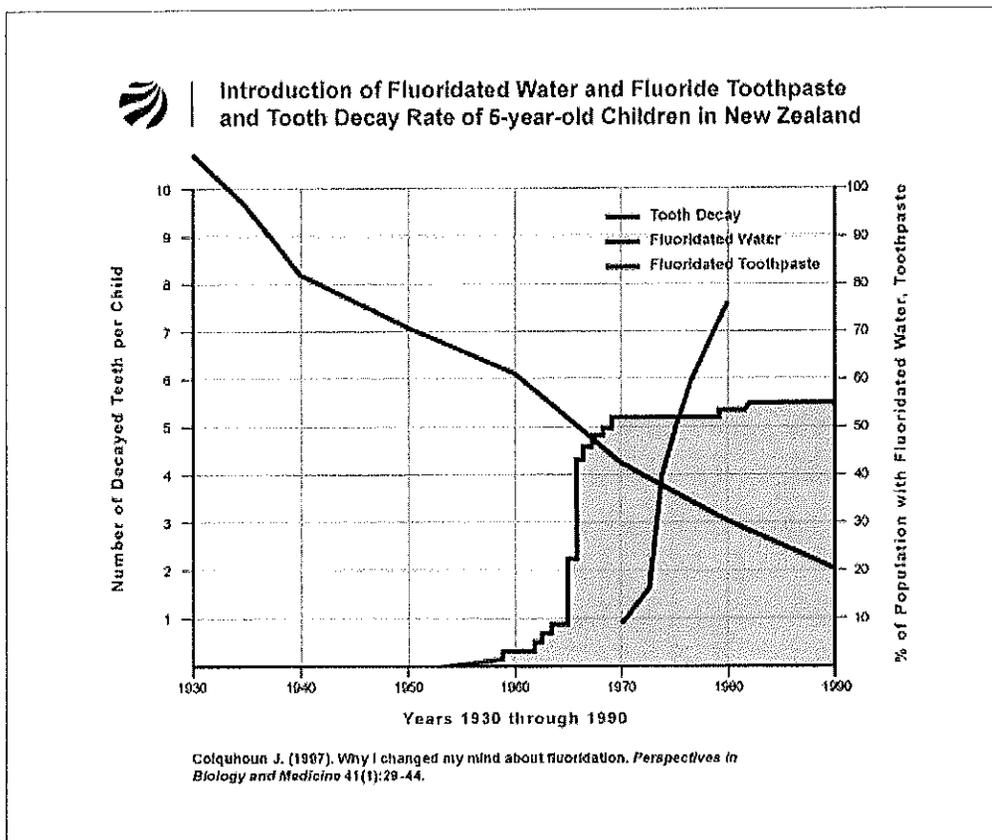
Despite some claims to the contrary, water fluoridation cannot prevent the oral health crises that result from rampant poverty, inadequate nutrition, and lack of access to dental care. There have been numerous reports of severe dental crises in low-income neighborhoods of US cities that have been fluoridated for over 20 years (e.g., Boston, Cincinnati, New York City, and Pittsburgh). In addition, research has repeatedly found fluoridation to be ineffective at preventing the most serious oral health problem facing poor children, namely "baby bottle tooth decay," otherwise known as early childhood caries (Barnes 1992; Shiboski 2003).

**16) TOOTH DECAY DOES NOT GO UP WHEN FLUORIDATION IS STOPPED.**

Where fluoridation has been discontinued in communities from Canada, the former East Germany, Cuba and Finland, dental decay has not increased but has generally continued to decrease (Maupomé 2001; Kunzel & Fischer, 1997, 2000; Kunzel 2000; Seppa 2000).

**17) TOOTH DECAY WAS COMING DOWN BEFORE FLUORIDATION STARTED.**

Modern research shows that decay rates were coming down before fluoridation was introduced in Australia and New Zealand and have continued to decline even after its benefits would have been maximized. (Colquhoun 1997; Diesendorf 1986). As the following figure indicates, many other factors are responsible for the decline of tooth decay that has been universally reported throughout the western world.



## **18) THE STUDIES THAT LAUNCHED FLUORIDATION WERE METHODOLOGICALLY FLAWED.**

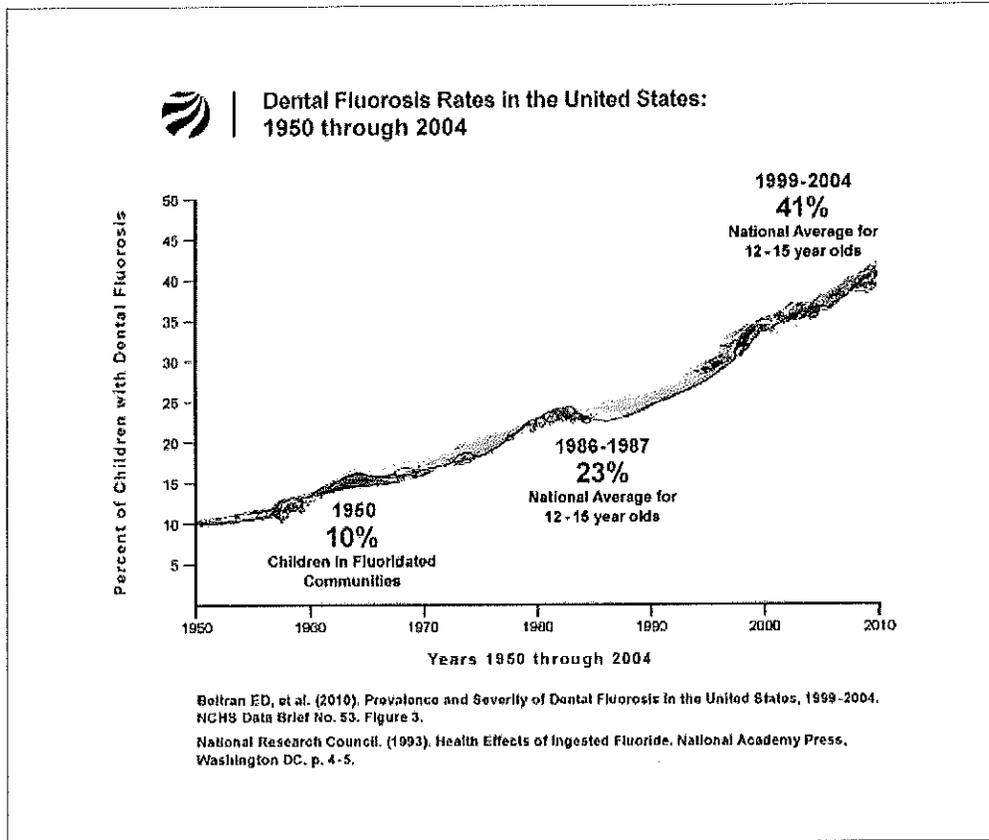
The early trials conducted between 1945 and 1955 in North America that helped to launch fluoridation, have been heavily criticized for their poor methodology and poor choice of control communities (De Stefano 1954; Sutton 1959, 1960, 1996; Ziegelbecker 1970).

According to Dr. Hubert Arnold, a statistician from the University of California at Davis, the early fluoridation trials "are especially rich in fallacies, improper design, invalid use of statistical methods, omissions of contrary data, and just plain muddleheadedness and hebetude." Serious questions have also been raised about Trendley Dean's (the father of fluoridation) famous 21-city study from 1942 (Ziegelbecker 1981).

## **CHILDREN ARE BEING OVER-EXPOSED TO FLUORIDE**

### **19) CHILDREN ARE BEING OVER-EXPOSED TO FLUORIDE.**

The fluoridation program has massively failed to achieve one of its key objectives, i.e., to lower dental decay rates while limiting the occurrence of dental fluorosis (a discoloring of tooth enamel caused by too much fluoride). The goal of the early promoters of fluoridation was to limit dental fluorosis (in its very mild form) to 10% of children (NRC 1993, pp. 6-7). In 2010, however, the Centers for Disease Control and Prevention (CDC) reported that 41% of American adolescents had dental fluorosis, with 8.6% having mild fluorosis and 3.6% having either moderate or severe dental fluorosis (Beltran-Aguilar 2010).



As the 41% prevalence figure is a national average and includes children living in fluoridated and unfluoridated areas, the fluorosis rate in fluoridated communities will obviously be higher.

The British Government's York Review estimated that up to 48% of children in fluoridated areas worldwide have dental fluorosis in all forms, with 12.5% having fluorosis of aesthetic concern (McDonagh, 2000).

## 20) THE HIGHEST DOSES OF FLUORIDE ARE GOING TO BOTTLE-FED BABIES.

Because of their sole reliance on liquids for their food intake, infants consuming formula made with fluoridated water have the highest exposure to fluoride, by bodyweight, in the population. Because infant exposure to fluoridated water has been repeatedly found to be a major risk factor for developing dental fluorosis later in life (Marshall 2004; Hong 2006; Levy 2010), a number of dental researchers have recommended that parents of newborns not use fluoridated water when reconstituting formula (Ekstrand 1996; Pendry 1998; Fomon 2000; Brothwell 2003; Marshall 2004). Even the American

Dental Association (ADA), the most ardent institutional proponent of fluoridation, distributed a November 6, 2006 email alert to its members recommending that parents be advised that formula should be made with “low or no-fluoride water.” Unfortunately, the ADA has done little to get this information into the hands of parents. As a result, many parents remain unaware of the fluorosis risk from infant exposure to fluoridated water.

## **EVIDENCE OF HARM TO OTHER TISSUES**

### **21) DENTAL FLUOROSIS MAY BE AN INDICATOR OF WIDER SYSTEMIC DAMAGE.**

There have been many suggestions as to the possible biochemical mechanisms underlying the development of dental fluorosis (Matsuo 1998; Den Besten 1999; Sharma 2008; Duan 2011; Tye 2011) and they are complicated for a lay reader. While promoters of fluoridation are content to dismiss dental fluorosis (in its milder forms) as merely a cosmetic effect, it is rash to assume that fluoride is not impacting other developing tissues when it is visibly damaging the teeth by some biochemical mechanism (Groth 1973; Colquhoun 1997). Moreover, ingested fluoride can only cause dental fluorosis during the period before the permanent teeth have erupted (6-8 years), other tissues are potentially susceptible to damage throughout life. For example, in areas of naturally high levels of fluoride the first indicator of harm is dental fluorosis in children. In the same communities many older people develop skeletal fluorosis.

### **22) FLUORIDE MAY DAMAGE THE BRAIN.**

According to the National Research Council (2006), “it is apparent that fluorides have the ability to interfere with the functions of the brain.” In a review of the literature commissioned by the US Environmental Protection Agency (EPA), fluoride has been listed among about 100 chemicals for which there is substantial evidence of developmental neurotoxicity.” Animal experiments show that fluoride accumulates in the brain and alters mental behavior in a manner consistent with a neurotoxic agent (Mullenix 1995). In total, there have now been over 100 animal experiments showing that fluoride can damage the brain and impact learning and behavior. According to fluoridation proponents, these animal studies can be ignored because high doses were used. However, it is important to note that rats generally require five times more fluoride to reach the same plasma levels in humans (Sawan 2010). Further, one animal experiment found effects at remarkably low doses (Varner 1998). In this study, rats fed for one year with 1 ppm

fluoride in their water (the same level used in fluoridation programs), using either sodium fluoride or aluminum fluoride, had morphological changes to their kidneys and brains, an increased uptake of aluminum in the brain, and the formation of beta-amyloid deposits which are associated with Alzheimer's disease. Other animal studies have found effects on the brain at water fluoride levels as low as 5 ppm (Liu 2010).

### **23) FLUORIDE MAY LOWER IQ.**

There have now been 33 studies from China, Iran, India and Mexico that have reported an association between fluoride exposure and reduced IQ. One of these studies (Lin 1991) indicates that even just moderate levels of fluoride exposure (e.g., 0.9 ppm in the water) can exacerbate the neurological defects of iodine deficiency. Other studies have found IQ reductions at 1.9 ppm (Xiang 2003a,b); 0.3-3.0 ppm (Ding 2011); 1.8-3.9 ppm (Xu 1994); 2.0 ppm (Yao 1996, 1997); 2.1-3.2 ppm (An 1992); 2.38 ppm (Poureslami 2011); 2.45 ppm (Eswar 2011); 2.5 ppm (Seraj 2006); 2.85 ppm (Hong 2001); 2.97 ppm (Wang 2001, Yang 1994); 3.15 ppm (Lu 2000); 4.12 ppm (Zhao 1996). In the Ding study, each 1 ppm increase of fluoride in urine was associated with a loss of 0.59 IQ points. None of these studies indicate an adequate margin of safety to protect all children drinking artificially fluoridated water from this affect. According to the National Research Council (2006), "the consistency of the results [in fluoride/IQ studies] appears significant enough to warrant additional research on the effects of fluoride on intelligence." The NRC's conclusion has recently been amplified by a team of Harvard scientists whose fluoride/IQ meta-review concludes that fluoride's impact on the developing brain should be a "high research priority." (Choi et al., 2012). Except for two small IQ studies from New Zealand (Shannon et al., 1986; Spittle 1998) no fluoridating country has yet investigated the matter.

### **24) FLUORIDE MAY CAUSE NON-IQ NEUROTOXIC EFFECTS.**

Reduced IQ is not the only neurotoxic effect that may result from fluoride exposure. At least three human studies have reported an association between fluoride exposure and impaired visual-spatial organization (Calderon 2000; Li 2004; Rocha-Amador 2009); while four other studies have found an association between prenatal fluoride exposure and fetal brain damage (Han 1989; Du 1992; Dong 1993; Yu 1996).

## **25) FLUORIDE AFFECTS THE PINEAL GLAND.**

Studies by Jennifer Luke (2001) show that fluoride accumulates in the human pineal gland to very high levels. In her Ph.D. thesis, Luke has also shown in animal studies that fluoride reduces melatonin production and leads to an earlier onset of puberty (Luke 1997). Consistent with Luke's findings, one of the earliest fluoridation trials in the U.S. (Schlesinger 1956) reported that on average young girls in the fluoridated community reached menstruation 5 months earlier than girls in the non-fluoridated community. Inexplicably, no fluoridating country has attempted to reproduce either Luke's or Schlesinger's findings or examine the issue any further.

## **26) FLUORIDE AFFECTS THYROID FUNCTION.**

According to the U.S. National Research Council (2006), "several lines of information indicate an effect of fluoride exposure on thyroid function." In the Ukraine, Bachinskii (1985) found a lowering of thyroid function, among otherwise healthy people, at 2.3 ppm fluoride in water. In the middle of the 20th century, fluoride was prescribed by a number of European doctors to reduce the activity of the thyroid gland for those suffering from hyperthyroidism (overactive thyroid) (Stecher 1960; Waldbott 1978). According to a clinical study by Galletti and Joyet (1958), the thyroid function of hyperthyroid patients was effectively reduced at just 2.3 to 4.5 mg/day of fluoride ion. To put this finding in perspective, the Department of Health and Human Services (DHHS, 1991) has estimated that total fluoride exposure in fluoridated communities ranges from 1.6 to 6.6 mg/day. This is a remarkable fact, particularly considering the rampant and increasing problem of hypothyroidism (underactive thyroid) in the United States and other fluoridated countries. Symptoms of hypothyroidism include depression, fatigue, weight gain, muscle and joint pains, increased cholesterol levels, and heart disease. In 2010, the second most prescribed drug of the year was Synthroid (sodium levothyroxine) which is a hormone replacement drug used to treat an underactive thyroid.

## **27) FLUORIDE CAUSES ARTHRITIC SYMPTOMS.**

Some of the early symptoms of skeletal fluorosis (a fluoride-induced bone and joint disease that impacts millions of people in India, China, and Africa), mimic the symptoms of arthritis (Singh 1963; Franke 1975; Teotia 1976; Carnow 1981; Czerwinski 1988; DHHS 1991). According to a review on fluoridation published in Chemical & Engineering News, "Because some

of the clinical symptoms mimic arthritis, the first two clinical phases of skeletal fluorosis could be easily misdiagnosed” (Hileman 1988). Few, if any, studies have been done to determine the extent of this misdiagnosis, and whether the high prevalence of arthritis in America (1 in 3 Americans have some form of arthritis – CDC, 2002) and other fluoridated countries is related to growing fluoride exposure, which is highly plausible. Even when individuals in the U.S. suffer advanced forms of skeletal fluorosis (from drinking large amounts of tea), it has taken years of misdiagnoses before doctors finally correctly diagnosed the condition as fluorosis.

## **28) FLUORIDE DAMAGES BONE.**

An early fluoridation trial (Newburgh-Kingston 1945-55) found a significant two-fold increase in cortical bone defects among children in the fluoridated community (Schlesinger 1956). The cortical bone is the outside layer of the bone and is important to protect against fracture. While this result was not considered important at the time with respect to bone fractures, it did prompt questions about a possible link to osteosarcoma (Caffey, 1955; NAS, 1977). In 2001, Alarcon-Herrera and co-workers reported a linear correlation between the severity of dental fluorosis and the frequency of bone fractures in both children and adults in a high fluoride area in Mexico.

## **29) FLUORIDE MAY INCREASE HIP FRACTURES IN THE ELDERLY.**

When high doses of fluoride (average 26 mg per day) were used in trials to treat patients with osteoporosis in an effort to harden their bones and reduce fracture rates, it actually led to a higher number of fractures, particularly hip fractures (Inkovaara 1975; Gerster 1983; Dambacher 1986; O’Duffy 1986; Hedlund 1989; Bayley 1990; Gutteridge 1990, 2002; Orcel 1990; Riggs 1990 and Schnitzler 1990). Hip fracture is a very serious issue for the elderly, often leading to a loss of independence or a shortened life. There have been over a dozen studies published since 1990 that have investigated a possible relationship between hip fractures and long term consumption of artificially fluoridated water or water with high natural levels. The results have been mixed – some have found an association and others have not. Some have even claimed a protective effect. One very important study in China, which examined hip fractures in six Chinese villages, found what appears to be a dose-related increase in hip fracture as the concentration of fluoride rose from 1 ppm to 8 ppm (Li 2001) offering little comfort to those who drink a lot of

fluoridated water. Moreover, in the only human epidemiological study to assess bone strength as a function of bone fluoride concentration, researchers from the University of Toronto found that (as with animal studies) the strength of bone declined with increasing fluoride content (Chachra 2010). Finally, a recent study from Iowa (Levy 2009), published data suggesting that low-level fluoride exposure may have a detrimental effect on cortical bone density in girls (an effect that has been repeatedly documented in clinical trials and which has been posited as an important mechanism by which fluoride may increase bone fracture rates).

### **30) PEOPLE WITH IMPAIRED KIDNEY FUNCTION ARE PARTICULARLY VULNERABLE TO BONE DAMAGE.**

Because of their inability to effectively excrete fluoride, people with kidney disease are prone to accumulating high levels of fluoride in their bone and blood. As a result of this high fluoride body burden, kidney patients have an elevated risk for developing skeletal fluorosis. In one of the few U.S. studies investigating the matter, crippling skeletal fluorosis was documented among patients with severe kidney disease drinking water with just 1.7 ppm fluoride (Johnson 1979). Since severe skeletal fluorosis in kidney patients has been detected in small case studies, it is likely that larger, systematic studies would detect skeletal fluorosis at even lower fluoride levels.

### **31) FLUORIDE MAY CAUSE BONE CANCER (OSTEOSARCOMA).**

A U.S. government-funded animal study found a dose-dependent increase in bone cancer (osteosarcoma) in fluoride-treated, male rats (NTP 1990). Following the results of this study, the National Cancer Institute (NCI) reviewed national cancer data in the U.S. and found a significantly higher rate of osteosarcoma (a bone cancer) in young men in fluoridated versus unfluoridated areas (Hoover et al 1991a). While the NCI concluded (based on an analysis lacking statistical power) that fluoridation was not the cause (Hoover et al 1991b), no explanation was provided to explain the higher rates in the fluoridated areas. A smaller study from New Jersey (Cohn 1992) found osteosarcoma rates to be up to 6 times higher in young men living in fluoridated versus unfluoridated areas. Other epidemiological studies of varying size and quality have failed to find this relationship (a summary of these can be found in Bassin, 2001 and Connett & Neurath, 2005). There are three reasons why a fluoride-osteosarcoma connection is plausible:

First, fluoride accumulates to a high level in bone. Second, fluoride stimulates bone growth. And, third, fluoride can interfere with the genetic apparatus of bone cells in several ways; it has been shown to be mutagenic, cause chromosome damage, and interfere with the enzymes involved with DNA repair in both cell and tissue studies (Tsutsui 1984; Caspary 1987; Kishi 1993; Mihashi 1996; Zhang 2009). In addition to cell and tissue studies, a correlation between fluoride exposure and chromosome damage in humans has also been reported (Sheth 1994; Wu 1995; Meng 1997; Joseph 2000).

### **32) PROPONENTS HAVE FAILED TO REFUTE THE BASSIN-OSTEOSARCOMA STUDY.**

In 2001, Elise Bassin, a dentist, successfully defended her doctoral thesis at Harvard in which she found that young boys had a five-to-seven fold increased risk of getting osteosarcoma by the age of 20 if they drank fluoridated water during their mid-childhood growth spurt (age 6 to 8). The study was published in 2006 (Bassin 2006) but has been largely discounted by fluoridating countries because her thesis adviser Professor Chester Douglass (a promoter of fluoridation and a consultant for Colgate) promised a larger study that he claimed would discount her thesis (Douglass and Joshipura, 2006). Now, after 5 years of waiting the Douglass study has finally been published (Kim 2011) but in no way does this study discount Bassin's findings. The study, which used far fewer controls than Bassin's analysis, did not even attempt to assess the age-specific window of risk that Bassin identified. Indeed, by the authors' own admission, the study had no capacity to assess the risk of osteosarcoma among children and adolescents (the precise population of concern). For a critique of the Douglass study, [click here](#).

### **33) FLUORIDE MAY CAUSE REPRODUCTIVE PROBLEMS.**

Fluoride administered to animals at high doses wreaks havoc on the male reproductive system – it damages sperm and increases the rate of infertility in a number of different species (Kour 1980; Chinoy 1989; Chinoy 1991; Susheela 1991; Chinoy 1994; Kumar 1994; Narayana 1994a,b; Zhao 1995; Elbetieha 2000; Ghosh 2002; Zakrzewska 2002). In addition, an epidemiological study from the US found increased rates of infertility among couples living in areas with 3 ppm or more fluoride in the water (Freni 1994), two studies have found increased fertility among men living in high-fluoride areas of China and

India (Liu 1988; Neelam 1987); four studies have found reduced level of circulating testosterone in males living in high fluoride areas (Hao 2010; Chen P 1997; Susheela 1996; Barot 1998), and a study of fluoride-exposed workers reported a “subclinical reproductive effect” (Ortiz-Perez 2003). While animal studies by FDA researchers have failed to find evidence of reproductive toxicity in fluoride-exposed rats (Sprando 1996, 1997, 1998), the National Research Council (2006) has recommended that, “the relationship between fluoride and fertility requires additional study.”

### **34) SOME INDIVIDUALS ARE HIGHLY SENSITIVE TO LOW LEVELS OF FLUORIDE AS SHOWN BY CASE STUDIES AND DOUBLE BLIND STUDIES.**

In one study, which lasted 13 years, Feltman and Kosel (1961) showed that about 1% of patients given 1 mg of fluoride each day developed negative reactions. Many individuals have reported suffering from symptoms such as fatigue, headaches, rashes and stomach and gastro intestinal tract problems, which disappear when they avoid fluoride in their water and diet (Shea 1967; Waldbott 1978; Moolenburgh 1987). Frequently the symptoms reappear when they are unwittingly exposed to fluoride again (Spittle, 2008). No fluoridating government has conducted scientific studies to take this issue beyond these anecdotal reports. Without the willingness of governments to investigate these reports scientifically, should we as a society be forcing these people to ingest fluoride?

### **35) OTHER SUBSETS OF POPULATION ARE MORE VULNERABLE TO FLUORIDE'S TOXICITY.**

In addition to people suffering from impaired kidney function discussed in reason #30 other subsets of the population are more vulnerable to fluoride's toxic effects. According to the Agency for Toxic Substances and Disease Registry (ATSDR 1993) these include: infants, the elderly, and those with diabetes mellitus. Also vulnerable are those who suffer from malnutrition (e.g., calcium, magnesium, vitamin C, vitamin D and iodine deficiencies and protein-poor diets) and those who have diabetes insipidus. See: Greenberg 1974; Klein 1975; Massler & Schour 1952; Marier & Rose 1977; Lin 1991; Chen 1997; Seow 1994; Teotia 1998.

## **NO MARGIN OF SAFETY**

### **36) THERE IS NO MARGIN OF SAFETY FOR SEVERAL HEALTH EFFECTS.**

No one can deny that high natural levels of fluoride damage health. Millions of people in India and China have had their health compromised by fluoride. The real question is whether there is an adequate margin of safety between the doses shown to cause harm in published studies and the total dose people receive consuming uncontrolled amounts of fluoridated water and non-water sources of fluoride.

This margin of safety has to take into account the wide range of individual sensitivity expected in a large population (a safety factor of 10 is usually applied to the lowest level causing harm). Another safety factor is also needed to take into account the wide range of doses to which people are exposed. There is clearly no margin of safety for dental fluorosis (CDC, 2010) and based on the following studies nowhere near an adequate margin of safety for lowered IQ (Xiang 2003a,b; Ding 2011; Choi 2012); lowered thyroid function (Galletti & Joyet 1958; Bachinskii 1985; Lin 1991); bone fractures in children (Alarcon-Herrera 2001) or hip fractures in the elderly (Kurtio 1999; Li 2001). All of these harmful effects are discussed in the NRC (2006) review.

## **ENVIRONMENTAL JUSTICE**

### **37) LOW-INCOME FAMILIES PENALIZED BY FLUORIDATION.**

Those most likely to suffer from poor nutrition, and thus more likely to be more vulnerable to fluoride's toxic effects, are the poor, who unfortunately, are the very people being targeted by new fluoridation programs. While at heightened risk, poor families are least able to afford avoiding fluoride once it is added to the water supply. No financial support is being offered to these families to help them get alternative water supplies or to help pay the costs of treating unsightly cases of dental fluorosis.

### **38) BLACK AND HISPANIC CHILDREN ARE MORE VULNERABLE TO FLUORIDE'S TOXICITY.**

According to the CDC's national survey of dental fluorosis, black and Mexican-American children have significantly higher rates of dental fluorosis than white children (Beltran-Aguilar 2005, Table 23). The recognition that minority children appear to be more vulnerable to toxic effects of fluoride, combined with the

fact that low-income families are less able to avoid drinking fluoridated water, has prompted prominent leaders in the environmental-justice movement to oppose mandatory fluoridation in Georgia. In a statement issued in May 2011, Andrew Young, a colleague of Martin Luther King, Jr., and former Mayor of Atlanta and former US Ambassador to the United Nations, stated:

*"I am most deeply concerned for poor families who have babies: if they cannot afford unfluoridated water for their babies' milk formula, do their babies not count? Of course they do. This is an issue of fairness, civil rights, and compassion. We must find better ways to prevent cavities, such as helping those most at risk for cavities obtain access to the services of a dentist... My father was a dentist. I formerly was a strong believer in the benefits of water fluoridation for preventing cavities. But many things that we began to do 50 or more years ago we now no longer do, because we have learned further information that changes our practices and policies. So it is with fluoridation."*

### **39) MINORITIES ARE NOT BEING WARNED ABOUT THEIR VULNERABILITIES TO FLUORIDE.**

The CDC is not warning black and Mexican-American children that they have higher rates of dental fluorosis than Caucasian children (see #38). This extra vulnerability may extend to other toxic effects of fluoride. Black Americans have higher rates of lactose intolerance, kidney problems and diabetes, all of which may exacerbate fluoride's toxicity.

### **40) TOOTH DECAY REFLECTS LOW-INCOME NOT LOW-FLUORIDE INTAKE.**

Since dental decay is most concentrated in poor communities, we should be spending our efforts trying to increase the access to dental care for low-income families. The highest rates of tooth decay today can be found in low-income areas that have been fluoridated for many years. The real "Oral Health Crisis" that exists today in the United States, is not a lack of fluoride but poverty and lack of dental insurance. The Surgeon General has estimated that 80% of dentists in the US do not treat children on Medicaid.

## **THE LARGELY UNTESTED CHEMICALS USED IN FLUORIDATION PROGRAMS**

### **41) THE CHEMICALS USED TO FLUORIDATE WATER ARE NOT PHARMACEUTICAL GRADE.**

Instead, they largely come from the wet scrubbing systems of the phosphate fertilizer industry. These chemicals (90% of which are sodium fluorosilicate and fluorosilicic acid), are classified hazardous wastes contaminated with various impurities.

Recent testing by the National Sanitation Foundation suggest that the levels of arsenic in these silicon fluorides are relatively high (up to 1.6 ppb after dilution into public water) and of potential concern (NSF 2000 and Wang 2000). Arsenic is a known human carcinogen for which there is no safe level. This one contaminant alone could be increasing cancer rates—and unnecessarily so.

### **42) THE SILICON FLUORIDES HAVE NOT BEEN TESTED COMPREHENSIVELY.**

The chemical usually tested in animal studies is pharmaceutical grade sodium fluoride, not industrial grade fluorosilicic acid. Proponents claim that once the silicon fluorides have been diluted at the public water works they are completely dissociated to free fluoride ions and hydrated silica and thus there is no need to examine the toxicology of these compounds. However, while a study from the University of Michigan (Finney et al., 2006) showed complete dissociation at neutral pH, in acidic conditions (pH 3) there was a stable complex containing five fluoride ions. Thus the possibility arises that such a complex may be regenerated in the stomach where the pH lies between 1 and 2.

### **43) THE SILICON FLUORIDES MAY INCREASE LEAD UPTAKE INTO CHILDREN'S BLOOD.**

Studies by Masters and Coplan (1999, 2000, 2007), and to a lesser extent Macek (2006), show an association between the use of fluorosilicic acid (and its sodium salt) to fluoridate water and an increased uptake of lead into children's blood. Because of lead's acknowledged ability to damage the

developing brain, this is a very serious finding. Nevertheless, it is being largely ignored by fluoridating countries. This association received some strong biochemical support from an animal study by Sawan et al. (2010) who found that exposure of rats to a combination of fluorosilicic acid and lead in their drinking water increased the uptake of lead into blood some threefold over exposure to lead alone.

#### **44) FLUORIDE MAY LEACH LEAD FROM PIPES, BRASS FITTINGS AND SOLDERED JOINTS.**

In tightly controlled laboratory experiments, Maas et al (2007) have shown that fluoridating agents in combination with chlorinating agents such as chloroamine increase the leaching of lead from brass fittings used in plumbing. While proponents may argue about the neurotoxic effects of low levels of fluoride there is no argument that lead at very low levels lowers IQ in children.

## **CONTINUED PROMOTION OF FLUORIDATION IS UNSCIENTIFIC**

#### **45) KEY HEALTH STUDIES HAVE NOT BEEN DONE.**

In the January 2008 issue of Scientific American, Professor John Doull, the chairman of the important 2006 National Research Council review, Fluoride in Drinking Water: A Review of EPA's Standards, is quoted as saying:

*“What the committee found is that we’ve gone with the status quo regarding fluoride for many years—for too long really—and now we need to take a fresh look . . . In the scientific community people tend to think this is settled. I mean, when the U.S. surgeon general comes out and says this is one of the top 10 greatest achievements of the 20th century, that’s a hard hurdle to get over. But when we looked at the studies that have been done, we found that many of these questions are unsettled and we have much less information than we should, considering how long this [fluoridation] has been going on.”*

The absence of studies is being used by promoters as meaning the absence of harm. This is an irresponsible position.

#### **46) ENDORSEMENTS DO NOT REPRESENT SCIENTIFIC EVIDENCE.**

Many of those promoting fluoridation rely heavily on a list of endorsements. However, the U.S. PHS first endorsed fluoridation in 1950, before one single trial had been completed and before any significant health studies had been published (see chapters 9 and 10 in *The Case Against Fluoride* for the significance of this PHS endorsement for the future promotion of fluoridation). Many other endorsements swiftly followed with little evidence of any scientific rationale for doing so. The continued use of these endorsements has more to do with political science than medical science.

#### **47) REVIEW PANELS HAND-PICKED TO DELIVER A PRO-FLUORIDATION RESULT.**

Every so often, particularly when their fluoridation program is under threat, governments of fluoridating countries hand-pick panels to deliver reports that provide the necessary re-endorsement of the practice.

In their recent book *Fluoride Wars* (2009), which is otherwise slanted toward fluoridation, Alan Freeze and Jay Lehr concede this point when they write:

*There is one anti-fluoridationist charge that does have some truth to it. Anti-fluoride forces have always claimed that the many government-sponsored review panels set up over the years to assess the costs and benefits of fluoridation were stacked in favor of fluoridation. A review of the membership of the various panels confirms this charge. The expert committees that put together reports by the American Association for the Advancement of Science in 1941, 1944 and 1954; the National Academy of Sciences in 1951, 1971, 1977 and 1993; the World Health Organization in 1958 and 1970; and the U.S. Public Health Service in 1991 are rife with the names of well-known medical and dental researchers who actively campaigned on behalf of fluoridation or whose research was held in high regard in the pro-fluoridation movement. Membership was interlocking and incestuous.*

The most recent examples of these self-fulfilling prophecies have come from the Irish Fluoridation Forum (2002); the National Health and Medical Research Council (NHMRC, 2007) and Health Canada (2008, 2010). The latter used a panel of six experts to review the health literature. Four of the six were pro-fluoridation dentists and the other two had no demonstrated

expertise on fluoride. A notable exception to this trend was the appointment by the U.S. National Research Council of the first balanced panel of experts ever selected to look at fluoride's toxicity in the U.S. This panel of twelve reviewed the US EPA's safe drinking water standards for fluoride. After three and half years the panel concluded in a 507- page report that the safe drinking water standard was not protective of health and a new maximum contaminant level goal (MCLG) should be determined (NRC, 2006). If normal toxicological procedures and appropriate margins of safety were applied to their findings this report should spell an end to water fluoridation. Unfortunately in January of 2011 the US EPA Office of Water made it clear that they would not determine a value for the MCLG that would jeopardize the water fluoridation program (EPA press release, Jan 7, 2011. Once again politics was allowed to trump science.

## **MORE AND MORE INDEPENDENT SCIENTISTS OPPOSE FLUORIDATION**

### **48) MANY SCIENTISTS OPPOSE FLUORIDATION.**

Proponents of fluoridation have maintained for many years— despite the fact that the earliest opponents of fluoridation were biochemists—that the only people opposed to fluoridation are not bona fide scientists. Today, as more and more scientists, doctors, dentists and other professionals, read the primary literature for themselves, rather than relying on self-serving statements from the ADA and the CDC, they are realizing that they and the general public have not been diligently informed by their professional bodies on this subject. As of January 2012, over 4,000 professionals have signed a statement calling for an end to water fluoridation worldwide. This statement and a list of signatories can be found on the website of the Fluoride Action Network. A glimpse of the caliber of those opposing fluoridation can be gleaned by watching the 28-minute video “Professional Perspectives on Water fluoridation” which can be viewed online at the same FAN site.

## **PROPONENTS' DUBIOUS TACTICS**

### **49) PROPONENTS USUALLY REFUSE TO DEFEND FLUORIDATION IN OPEN DEBATE.**

While pro-fluoridation officials continue to promote fluoridation with undiminished fervor, they usually refuse to defend the practice in open public debate – even when challenged to do so by organizations such as the Association for Science in the Public Interest, the American College of Toxicology, or the U.S. EPA (Bryson 2004). According to Dr. Michael Easley, a prominent lobbyist for fluoridation in the US, “Debates give the illusion that a scientific controversy exists when no credible people support the fluorophobics’ view” (Easley, 1999). In light of proponents’ refusal to debate this issue, Dr. Edward Groth, a Senior Scientist at Consumers Union, observed that, “the political profluoridation stance has evolved into a dogmatic, authoritarian, essentially antiscientific posture, one that discourages open debate of scientific issues” (Martin 1991).

### **50) PROPONENTS USE VERY DUBIOUS TACTICS TO PROMOTE FLUORIDATION.**

Many scientists, doctors and dentists who have spoken out publicly on this issue have been subjected to censorship and intimidation (Martin 1991). Dr. Phyllis Mullenix was fired from her position as Chair of Toxicology at Forsythe Dental Center for publishing her findings on fluoride and the brain (Mullenix 1995); and Dr. William Marcus was fired from the EPA for questioning the government’s handling of the NTP’s fluoride-cancer study (Bryson 2004). Many dentists and even doctors tell opponents in private that they are opposed to this practice but dare not speak out in public because of peer pressure and the fear of recriminations. Tactics like this would not be necessary if those promoting fluoridation were on secure scientific and ethical grounds.

## CONCLUSION

When it comes to controversies surrounding toxic chemicals, vested interests traditionally do their very best to discount animal studies and quibble with epidemiological findings. In the past, political pressures have led government agencies to drag their feet on regulating asbestos, benzene, DDT, PCBs, tetraethyl lead, tobacco and dioxins. With fluoridation we have had a sixty-year delay. Unfortunately, because government officials and dental leaders have put so much of their credibility on the line defending fluoridation, and because of the huge liabilities waiting in the wings if they admit that fluoridation has caused an increase in hip fracture, arthritis, bone cancer, brain disorders or thyroid problems, it will be very difficult for them to speak honestly and openly about the issue. But they must, not only to protect millions of people from unnecessary harm, but to protect the notion that, at its core, public health policy must be based on sound science, not political expediency. They have a tool with which to do this: it's called the Precautionary Principle. Simply put, this says: if in doubt leave it out. This is what most European countries have done and their children's teeth have not suffered, while their public's trust has been strengthened.

Just how much doubt is needed on just one of the health concerns identified above, to override a benefit, which when quantified in the largest survey ever conducted in the US, amounts to less than one tooth surface (out of 128) in a child's mouth?

While fluoridation may not be the greatest environmental health threat, it is one of the easiest to end. It is as easy as turning off a spigot in the public water works. But to turn off that spigot takes political will and to get that we need masses more people informed and organized. Please get these 50 reasons to all your friends and encourage them to get fluoride out of their community and to help ban this practice worldwide.

## **POSTSCRIPT**

Further arguments against fluoridation, can be viewed at <http://fluoridealert.org> and in the book *The Case Against Fluoridation* (Chelsea Green, 2010). Arguments for fluoridation can be found at <http://www.ada.org>

## **PUBLICATION HISTORY OF THE 50 REASONS**

The 50 Reasons were first compiled by Paul Connett and presented in person to the Irish Fluoridation Forum in October 2000. The document was refined in 2004 and published in *Medical Veritas*. In the introduction to the 2004 version it was explained that after over four years the Irish authorities had not been able to muster a response to the 50 Reasons, despite agreeing to do so in 2000. Eventually, an anonymous, incomplete and superficial response was posted on the Irish Department of Health and Children's website (see this response and addendum at [http://www.dohc.ie/other\\_health\\_issues/dental\\_research/](http://www.dohc.ie/other_health_issues/dental_research/)). Paul Connett's comprehensive response to this response can be accessed at <http://fluoridealert.org/50reasons.ireland.pdf>. We learned on August 7, 2011 that this governmental response was prepared by an external contractor at a cost to the Irish taxpayers' of over 30,000 Euros.

Since 2004, there have been many major scientific developments including the publication of the U.S. National Research Council report (NRC, 2006); the publication of Bassin's study on Osteosarcoma (Bassin 2006), and many more studies of fluoride's interaction with the brain, that necessitated a major update of the 50 Reasons in August 2011. This update was made with the generous assistance of James Beck, MD, PhD, Michael Connett, JD, Hardy Limeback, DDS, PhD, David McRae and Spedding Micklem, D.Phil. Additional developments in 2012, including FAN's translation of over 20 Chinese studies on fluoride toxicity and publication of the Harvard team's meta-review of fluoride and IQ (Choi 2012), warranted a further update in August 2012, with the extremely helpful assistance of my son, Michael Connett.

All cited references in this article can be found at the Fluoride Action Network's Online Bibliography, available at:

**[WWW.FLUORIDEALERT.ORG/RESEARCHERS/FAN-BIBLIOGRAPHY/](http://WWW.FLUORIDEALERT.ORG/RESEARCHERS/FAN-BIBLIOGRAPHY/)**

# Material Safety Data Sheet

## Sodium Fluoride

### SECTION 1 : CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<b>Product Name</b>	Sodium fluoride
<b>Product Codes</b>	038 001
<b>CAS#</b>	7681-49-4
<b>RTECS</b>	WB0350010
<b>TSCA</b>	TSCA 8(b) inventory: Sodium fluoride
<b>CI#</b>	Not available.
<b>Synonym</b>	Sodium Fluoride Powder, Reagent ACS; Sodium Fluoride Powder USP, EP, BP; Sodium Hydrofluoride; Sodium Monofluoride
<b>Chemical Name</b>	Sodium Fluoride
<b>Chemical Formula</b>	NaF
<b>Contact Information</b>	<b>Madras Fluorine Private Ltd</b> New No.71, 4 <sup>th</sup> Main Road Gandhi Nagar, Adyar Chennai 600 020, India Ph : 00-91-44-24426830 / 32910296 Fax : 00-91-44-24420654 E-mail : <a href="mailto:mfpl_exim@airtelmail.in">mfpl_exim@airtelmail.in</a>

### SECTION 2 : COMPOSITION / INFORMATION ON INGREDIENTS

**Composition:**

<b>Name</b>	<b>CAS #</b>	<b>% by Weight</b>
Sodium Fluoride	7681-49-4	100

**Toxicological Data on Ingredients** : Sodium Fluoride : ORAL (LD50) Acute : 52 mg/kg(Rat) 57 mg/kg (Mouse)

### **SECTION 3 : HAZARDS IDENTIFICATION**

#### **Potential Acute Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant, corrosive), of ingestion, of inhalation. Slightly hazardous in case of skin contact (corrosive). Severe over-exposure can result in death.

#### **Potential Chronic Health Effects:**

**CARCINOGENIC EFFECTS:** A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.

**MUTAGENIC EFFECTS:** Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.

**TERATOGENIC EFFECTS:** Not available.

**DEVELOPMENTAL TOXICITY:** Not available.

The substance may be toxic to kidneys, lungs, the nervous system, heart, gastrointestinal tract, cardiovascular system, bones, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

### **SECTION 4 : FIRST AID MEASURES**

#### **Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

#### **Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

#### **Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

#### **Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

#### **Serious Inhalation:**

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

**Ingestion:**

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

**Serious Ingestion:** Not available.

**SECTION 5 : FIRE-FIGHTING MEASURES**

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of static discharge: Not available.

Slightly explosive in presence of heat.

Non-explosive in presence of shocks.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Containers may explode when heated

**SECTION 6 : ACCIDENTAL RELEASE MEASURES****Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container.

**Large Spill:**

Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

## SECTION 7 : HANDLING AND STORAGE

### Precautions:

Do not ingest. Do not breathe dust. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis.

### Storage:

Keep container tightly closed. Keep container in a cool, well-ventilated area.

## SECTION 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

### Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

### Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits:

TWA: 2.5 (mg/m<sup>3</sup>) from NIOSH

Consult local authorities for acceptable exposure limits.

## SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state and appearance</b>	Solid. (Crystals solid. crystalline powder.)
<b>Odor</b>	Odorless.
<b>Taste</b>	Salty
<b>Molecular Weight</b>	41.99 g/mole
<b>Color</b>	White.

<b>pH (1% soln/water)</b>	Not available.
<b>Boiling Point</b>	1704 °C (3099.2 °F)
<b>Melting Point</b>	993 °C (1819.4 °F)
<b>Critical Temperature</b>	Not available.
<b>Specific Gravity</b>	2.78 (Water = 1)
<b>Vapor Pressure</b>	Not applicable.
<b>Vapor Density</b>	Not available.
<b>Volatility</b>	Not available.
<b>Odor Threshold</b>	Not available.

<b>Water/Oil Dist. Coeff.</b>	Not available.
<b>Ionicity (In Water)</b>	Not available.
<b>Dispersion Properties</b>	See solubility in water.
<b>Solubility</b>	Soluble in cold water, hot water. Solubility in water: 5g/100 ml @ 100 deg. C, 4.3 g/100 @ 25 deg C, 4.0 g/100 ml @ 15 deg. C. Very slightly soluble in alcohol

<b>SECTION 10 : STABILITY AND REACTIVITY</b>	
<b>Stability:</b>	The product is stable.
<b>Instability Temperature:</b>	Not available.
<b>Conditions of Instability:</b>	Incompatible materials, dust generation, excess heat
<b>Incompatibility with various substances:</b>	Reactive with oxidizing agents, metals, acids, alkalis.
<b>Corrosivity:</b>	Not available.
<b>Special Remarks on Reactivity:</b>	Contact with metals may evolve flammable hydrogen gas. Sodium reacts with acids to form hydrogen fluoride. Alkali fluorides (except lithium salt) absorb Sodium Fluoride to form acid fluorides.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## SECTION 11 : TOXICOLOGICAL INFORMATION

**Routes of Entry:** Inhalation. Ingestion.

**Toxicity to Animals:** Acute oral toxicity (LD50): 52 mg/kg [Rat].

### **Chronic Effects on Humans:**

**CARCINOGENIC EFFECTS:** A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.

**MUTAGENIC EFFECTS:** Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, lungs, the nervous system, heart, gastrointestinal tract, cardiovascular system, bones, teeth.

### **Other Toxic Effects on Humans:**

Hazardous in case of skin contact (irritant), of eye contact (corrosive), of ingestion, of inhalation. Slightly hazardous in case of skin contact (corrosive).

### **Special Remarks on Toxicity to Animals:**

**Lowest Published Lethal Dose:**

LDL [Human] - Route: Oral; Dose: 71 mg/kg

LDL [Woman] - Route: Oral; Dose: 90 mg/kg

LDL [Woman] - Route: Oral; Dose: 360 mg/kg

LDL [Mouse] - Route: Skin; Dose: 300 mg/kg

### **Special Remarks on Chronic Effects on Humans:**

May cause adverse reproductive effects (fertility, fetotoxicity), and birth defects based on animal data. May cause cancer based on animal data. May cause genetic (mutagenic) and tumorigenic effects.

### **Special Remarks on other Toxic Effects on Humans:**

**Acute Potential Health Effects:**

**Skin:** Causes skin irritation and possible burns, especially if skin is wet or moist.

**Eyes:** Causes eye irritation and burns. May cause chemical conjunctivitis and corneal damage.

**Ingestion:** Harmful if swallowed. Causes digestive (gastrointestinal) tract irritation and burns. May cause severe and permanent damage to the digestive. Ingestion of large amounts may cause salivation, thirst, nausea, vomiting, hypermotility, diarrhea, and abdominal pain. May affect behavior/central nervous system/nervous system (headache, nervousness, dizziness, seizures, convulsions, tremor, muscle weakness, somnolence), respiration (respiratory depression, dyspnea), cardiovascular system (weak pulse, hypotension, dysrhythmias, cardiac arrest), liver, urinary system (polyuria, polydypsia) brain, metabolism (loss of appetite, hypocalcemia, hyperkalemia, hypomagnesia, ), teeth, bones, and blood (changes in red and white blood cell count, interference in blood coagulation) **Inhalation:** Causes irritation and chemical burns of the respiratory tract with coughing, breathing difficulty and possibly nasal septum perforation and coma. May affect bones.

**Chronic Potential Health Effects:**

Chronic ingestion may cause fluorosis. Effects of fluorosis may include joint pain, weakness, limited joint mobility, brittle bones, ossifications on x-ray, thickening of long bone cortices, calcification of ligaments, osteomalacia, osteosclerosis (skeletal (bone and teeth) abnormalities) and mottled tooth enamel. Other symptoms may include anemia, nausea, vomiting, diarrhea or constipation, kidney damage and weight loss/anorexia. Chronic inhalation may cause bronchitis to develop with cough, phlegm, and/or shortness of breath. , liver (hepatic enzymes increased, jaundice),

## **SECTION 12 : ECOLOGICAL INFORMATION**

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## **SECTION 13 : DISPOSAL CONSIDERATIONS**

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## **SECTION 14 : TRANSPORT INFORMATION**

**DOT Classification:** CLASS 6.1: Poisonous material.

**Identification:** : Sodium fluoride UNNA: 1690 PG: III

**Special Provisions for Transport:** Not available.

## **SECTION 15 : REGULATORY INFORMATION**

**Federal and State Regulations:**

California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.  
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.  
Connecticut hazardous material survey.: Sodium fluoride  
Illinois chemical safety act: Sodium fluoride

New York release reporting list: Sodium fluoride  
Rhode Island RTK hazardous substances: Sodium fluoride  
Pennsylvania RTK: Sodium fluoride  
Massachusetts RTK: Sodium fluoride  
Massachusetts spill list: Sodium fluoride  
New Jersey: Sodium fluoride  
New Jersey spill list: Sodium fluoride  
Louisiana spill reporting: Sodium fluoride  
California Director's List of Hazardous Substances: Sodium fluoride  
TSCA 8(b) inventory: Sodium fluoride  
TSCA 8(a) PAIR: Sodium fluoride  
CERCLA: Hazardous substances.: Sodium fluoride: 1000 lbs. (453.6 kg)

**Other Regulations:**

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).  
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):**

CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC).  
CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**

R25- Toxic if swallowed.  
R32- Contact with acids liberates very toxic gas.  
R36/38- Irritating to eyes and skin.  
S22- Do not breathe dust.  
S36- Wear suitable protective clothing.

S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**HMIS (U.S.A.):**

**Health Hazard: 2**

**Fire Hazard: 0**

**Reactivity: 0**

**Personal Protection: E**

**National Fire Protection Association (U.S.A.):**

**Health: 3**

**Flammability: 0**

**Reactivity: 0**

**Specific hazard:**

**Protective Equipment:**

Gloves.

Lab coat.

Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

### **Section 16: Other Information**

**References:** Not available.

**Other Special Considerations:** Not available.

**Creation Date** : 18.9.2000

**Revision Date** : 25.7.2006

***Disclaimer:***

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**THE CASE AGAINST**  
**Fluoride**

**How Hazardous Waste  
Ended Up in Our Drinking Water  
*and* the Bad Science and  
Powerful Politics  
That Keep It There**

**PAUL CONNETT, PhD  
JAMES BECK, MD, PhD | H. S. MICKLEM, DPhil**

Foreword by  
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## A Response to Pro-Fluoridation Claims

Proponents of fluoridation have made a number of claims that have been effective with an ill-informed public. However, when those claims are examined carefully, they are found to have little merit. Although opponents have pointed out the weaknesses and fallacies in some of these “chestnuts” over the many years of this debate, they continue to crop up. Let’s take a look at them.

*Claim 1: There is no difference in principle between chlorination and fluoridation.*

This is wrong. Chlorination treats water; fluoridation treats people. Water is treated with chlorine to make the water safe to drink. It kills the bacteria and other vectors that carry disease. Chlorination is not without its critics, but millions of lives have been saved by this process.

Fluoridation, on the other hand, is not used to make the water safe. It simply uses the public water supply to deliver medicine. Such a practice is rare, indeed, for obvious reasons. Once medicine is added to tap water, key controls are lost. You cannot control the dose, and you cannot control who gets the medicine. Moreover, you are forcing medication on people without their informed consent and, especially in the case of low-income families, without their ability to avoid the medicine if they wish.

*Claim 2: Fluoride is “natural.” We are just topping up what is there anyway.*

Natural does not necessarily mean good. Arsenic, like fluoride, leaches naturally from rocks into groundwater, but no one suggests topping that up. Besides, there is nothing “natural” about the fluoridating chemicals, as they are obtained largely from the wet scrubbers of the phosphate fertilizer industry (see chapter 3). The chemicals used in most fluoridation programs are either hexafluorosilicic acid or its sodium salt, and those silicon fluorides do not occur in nature. What is more, under international law they cannot be dumped into the sea, yet a dilution of about 180,000 to 1 is supposed to protect against all harm when the same chemicals are added to the domestic water supply. In chapter 3, we discussed the language used in a recent Q&A pamphlet from the Victoria (Australia) Department of Human Services in

an effort to persuade citizens that the chemicals used in fluoridation are not hazardous waste products of the fertilizer industry.

*Claim 3: Fluoride is a nutrient.*

As we explained in chapter 1, in order to establish that a substance is an essential nutrient, a researcher has to remove the substance from the diet and demonstrate that disease results. This has not been shown to occur with a lack of fluoride, nor is fluoride known to contribute to any normal metabolic process.

*Claim 4: Fluoridation is no different than adding iron, folic acid, or vitamin D to bread and other foodstuffs.*

There is a world of difference:

1. Iron, folic acid, and vitamin D are known essential nutrients. Fluoride is not.
2. All of those substances have large margins of safety between their toxic levels and their beneficial levels. Fluoride does not.
3. People who do not want those supplements can seek out foods without them. It is much more difficult to avoid tap water.

*Claim 5: The amount of fluoride added to the public water system, 1 ppm, is so small it couldn't possibly hurt you.*

Promoters use analogies such as 1 ppm is equivalent to one cent in \$10,000 or one inch in sixteen miles to make it appear that we are dealing with insignificant quantities of fluoride. Such analogies are nonsensical without reference to the toxicity of the chemical in question. For example, 1 ppm is about a million times higher than the safe concentration to swallow of dioxin, and 100 times higher than the safe drinking water standard for arsenic; it is also up to 250 times higher than the level of fluoride in mother's milk<sup>1</sup> (see chapter 12).

*Claim 6: Everything is toxic given a high enough dose, even water.*

This is correct, but one has to be careful when using the word *high*. Fluoride is extremely toxic, especially for young children, as the following quote from Dr. Gary Whitford, a leading fluoride researcher at the Medical College of Georgia, illustrates:

It may be concluded that if a child ingests a fluoride dose in excess of 15 mg F/kg, then death is likely to occur. A dose as low as

5 mg F/kg may be fatal for some children. Therefore, the probable toxic dose (PTD), defined as the threshold dose that could cause serious or life-threatening systemic signs and symptoms and that should trigger immediate emergency treatment and hospitalization, is 5 mg F/kg.<sup>2</sup>

Thus, according to Whitford, a 7 kg infant could be killed by a dose of just 35 milligrams of fluoride. To get such a dose would require swallowing 35 liters of water at 1 ppm (1 mg per liter). No infant could possibly drink 35 liters of water in one sitting, so we are *not* talking about killing babies with fluoridated water. But there is a world of difference between a *chronic* toxic dose and a lethal dose. What we are particularly concerned about is the impact of consuming water at 1 ppm *over an extended period of time*. In the case of infants, a huge concern is the possible impact on their mental development over the first few years of life, since studies have shown that levels as low as 1.9 ppm fluoride in water are associated with a lowering of IQ in China.<sup>3</sup> In the case of adults, we are concerned about lifelong exposure to levels of 6 mg per day or even lower and what damage that might do to bones and ligaments.<sup>4</sup>

*Claim 7: You would have to drink a whole bathtub of water to get a toxic dose of fluoride.*

Here again, proponents are confusing a *toxic* dose with a *lethal* dose—that is, a dose causing *illness or harmful effect* as opposed to a dose causing *death*. Opponents of fluoridation are not suggesting that people are going to be killed outright from drinking fluoridated water, but we are suggesting that it may cause immediate health problems in those who are very sensitive (chapter 13) and, with long-term exposure, persistent health problems in others (chapters 14–19).

*Claim 8: Fluoridated water is only delivered to the tap. No one is forced to drink it.*

Unfortunately, that is not a simple option, especially for families of low income who cannot afford bottled water or expensive fluoride filtration systems. Even those who can afford alternatives cannot easily protect themselves from the water they get outside the home. Fluoridated tap water is used in many processed foods and beverages (soda, beer, coffee, etc.).

*Claim 9: Fluoridation is needed to protect children in low-income families.*

This is a powerful and emotional argument. However, it ignores the fact that poor nutrition is most prevalent in families of low income, and the people most vulnerable to fluoride's toxic effects are those with a poor diet. Thus, while children from low-income families are a special target for this program, they are precisely the ones most likely to be harmed. Moreover, in chapter 8 we referenced some of the many distressing newspaper accounts of children suffering from tooth decay in low-income areas located in cities that have been fluoridated for over thirty years. Also in chapter 8 we reference the numerous state oral health reports indicating the continued disparity in tooth decay between low-income and high-income families, even in states with a high percentage of the population drinking fluoridated water.

*Claim 10: Fluoridation has been going on for over sixty years; if it caused any harm, we would know about it by now.*

Such statements would start to be meaningful only if fluoridated countries had conducted comprehensive health studies of their fluoridated populations. Most have not. Only a few health studies have been performed in the United States, most many years ago (see chapters 9 and 10); very few health studies have been performed in Australia, Canada, New Zealand, or the UK; and none has been performed in Colombia, Ireland, Israel, or Singapore (all countries with more than 50 percent of the population drinking fluoridated water). We discussed this and other examples of the very inadequate science involved in the promotion of fluoridation in chapter 22.

*Claim 11: According to the Centers for Disease Control and Prevention, fluoridation is one of the top ten public health achievements of the twentieth century.*

Most journalists, newspaper editors, and officials who quote this claim have little or no idea how poorly it is supported by the report that supposedly justifies the statement.<sup>5,6</sup> We have discussed this matter in several places, including chapter 23.

*Claim 12: For every dollar spent on fluoridation, \$38 is saved in dental costs.*

This statement is taken from another report written by members of the Oral Health Division of the CDC.<sup>7</sup> Two of its three authors, Susan Griffin and Scott Tomar, also wrote the report mentioned in Claim 11 above.

Griffin et al. inflated the benefits of fluoridation and ignored the costs of any side effects, including the one effect no one can deny, dental fluorosis. Cosmetic veneer treatment for fluorosis costs upward of \$1,000 per tooth. The CDC authors also allowed a loss of earnings of \$18 an hour for time off work to get a dental filling. Not all people lose pay when they get dental treatment, and certainly children don't.

*Claim 13: The majority of the U.S. population drinks fluoridated water.*

This statement is misused to put pressure on communities that do not fluoridate their water. They are led to believe that they are the odd ones out, behind the times, blocking progress. They are not. Only about 400 million people worldwide drink fluoridated water, and most of them live in North America. Globally, those who do are a distinct minority. Only eight countries have more than 50 percent of their population drinking fluoridated water; only 2 percent of the population of Europe drinks fluoridated water (see chapter 5).

*Claim 14: The majority of U.S. cities are fluoridated.*

There is a far longer list of cities in the rest of world that do not fluoridate than of cities in the United States that do. Moreover, low-income areas in some major fluoridated cities in America and Australia still have major childhood dental problems (see chapter 8).

*Claim 15: Every major dental and medical authority supports fluoridation.*

Here we return to the dubious nature of endorsements not backed up by independent and current reviews of the literature. Many of the major associations on the list frequently cited by the American Dental Association endorsed fluoridation before a single trial had been completed and before the first health study had been published, in 1954 (see chapters 9 and 10).

*Claim 16: When fluoridation is stopped, tooth decay rates go up.*

There now have been at least four modern studies showing that when fluoridation was halted in communities in East Germany, Finland, Cuba, and British Columbia (Canada), tooth decay rates did not go up. This issue was discussed in chapters 5 and 8.

*Claim 17: Fluoridation is "safe and effective."*

This empty phrase is parroted so many times by pro-fluoridation officials and dentists at meetings considering fluoridation that one begins to wonder if they

receive some kind of commission every time it is uttered! Be that as it may, mechanically repeating a phrase, no matter how often, without backing it up with solid supporting evidence does not make it true.

*Claim 18: Hundreds (or thousands) of studies demonstrate that fluoridation is effective.*

On the contrary, the UK's York Review was able to identify very few studies of even moderate quality, and the results were mixed<sup>8</sup> (see chapter 6).

*Claim 19: Fluoridation reduces tooth decay by 20–60 percent.*

In chapters 6–8, we examined in detail the evidence for fluoridation's benefits and found it to be very weak. Even a 20 percent reduction in tooth decay is a figure rarely found in more recent studies. Moreover, we have to remember that percentages can give a very misleading picture. For example, if an average of two decayed tooth *surfaces* are found in a non-fluoridated group and one decayed *surface* in a fluoridated group, that would amount to an impressive 50 percent reduction. But when we consider the total of 128 surfaces on a complete set of teeth, the picture—which amounts to an absolute saving in tooth decay of a mere 0.8 percent—does not look so impressive.

*Claim 20: Hundreds (or thousands) of studies demonstrate that fluoridation is safe.*

When proponents are asked to produce just one study (a primary study, not a governmental review) that has convinced them that fluoridation is safe, they are seldom able to do so. Apparently, they have taken such assurances from others at face value, without reading the literature for themselves. The fact is, it is almost impossible to prove conclusively that a substance has no ill effects. A careful and properly controlled study may show that, under the conditions and limitations of the investigation, no harm is apparent. A hundred such studies may permit a considerable degree of confidence—but in the case of fluoridation, very few studies have even been attempted. As fluoride accumulates progressively in the skeleton and probably the pineal gland, studies need to extend over a lifetime. In chapter 22, we listed the many health concerns that simply have not been investigated in fluoridated countries. Meanwhile, fluoride at moderate to high doses can cause serious health problems, leaving little or no margin of safety for people drinking fluoridated water (see chapter 20).

*Claim 21: Opponents of fluoridation do not have professional qualifications.*

Some opponents of fluoridation do not have professional qualifications (of course); many do. Many highly qualified doctors, dentists, and scientists have opposed fluoridation in the past and do so today. Currently, over 3,000 individuals from medicine, dentistry, science, and other relevant professions are calling for an end to fluoridation worldwide.<sup>9</sup> Furthermore, many opponents without professional qualifications have educated themselves on the science relevant to fluoridation and are qualified to evaluate many aspects of it.

*Claim 22: Opponents of fluoridation are a vocal minority.*

In a democratic society, opponents should not have to apologize for being vocal. As far as being a minority is concerned, it is frequently true that for any controversial issue only a minority of people get actively involved. However, it is our experience that the more educated people are on this issue, the more likely they are to oppose fluoridation. Usually, it is only when the matter is resolved by an appeal to "authority," with little resort to scientific information, that proponents prevail.

*Claim 23: Opponents of fluoridation use "junk science."*

The epithet "junk" is rarely defined and almost entirely subjective. It tends to mean scientific data that the speaker considers (1) inconclusive or (2) inconsistent with his or her personal prejudices. "Junk" is not a term that is used in respectable scientific discourse, but it crops up frequently when science impinges on politics, big business, or the law, where conflicts of interest lead to mudslinging.

*Claim 24: Opponents of fluoridation get their information from the Internet.*

No one denies that plenty of rubbish appears on the Internet. But just because a published study can be found using the Internet does not invalidate it. In fact, scientists now do much of their reading of the scientific literature online. The Fluoride Action Network maintains a Health Effects Database on its Web site, which provides citations, excerpts, abstracts, and in some cases complete pdf files of many published studies. Proponents would do well to read some of these papers, rather than trying to dismiss them because they are available online.

*Claim 25: There is no evidence that fluoride at the levels used in fluoridation schemes causes any health problems.*

There are three weaknesses to this argument. First, it does not make clear that fluoridating countries have done few basic health studies of popula-

tions drinking fluoridated water. Absence of studies does not mean absence of harm. Second, just because a study is conducted at a higher water fluoride level than 1 ppm does not mean that it is not relevant to water fluoridation. Toxicologists are nearly always extrapolating from high-dose animal experiments to estimate safe doses for humans. In the case of fluoride, we have the luxury of a large number of human studies conducted in countries with moderate to high levels of exposure to naturally occurring fluoride. What is required here is a “margin-of-safety” analysis (see chapter 20) to see if there is a sufficient safety margin between the doses that cause harm and the doses likely to be experienced in fluoridated communities. In our view, there is not. And third, it is not true that there is no evidence of ill effects from fluoride at present levels of fluoridation (see chapters 10–19).

*Claim 26: There is no evidence that fluoridation harms the thyroid.*

Even though many animal experiments show that fluoride can affect thyroid function, and even though some doctors between the 1930s and the 1950s used fluoride to lower thyroid function in hyperactive patients, governments that promote fluoridation have not taken this issue seriously. Very little research has been supported in fluoridating countries, but two studies raise concerns.<sup>10,11</sup> See chapter 16 for a full discussion of this issue.

*Claim 27: There is no evidence that fluoridation is associated with an increase in hip fractures.*

Not true: The evidence is mixed. Some studies show an increase in hip fractures among the elderly in fluoridated areas, and others do not. One of the better studies (Li et al.<sup>12</sup>) showed an increase in hip fractures in the elderly (in a series of villages) as the fluoride levels in the water rose from 1 ppm to 4.3 ppm (see chapter 17).

*Claim 28: There is no evidence that fluoride causes cancer.*

Again, the evidence is mixed. Some studies show an increase in osteosarcoma (a rare but frequently fatal bone cancer) among young men in fluoridated communities, and others do not. Even though the study results are mixed, a study by Elise Bassin from Harvard, with the most robust methodology to date, has shown a positive relationship between exposure to fluoride in the sixth, seventh, and eighth years of age and a fivefold to sevenfold increased risk of contracting osteosarcoma in young men by the age of twenty.<sup>13</sup> Although a large study has been promised that allegedly rebuts this finding,<sup>14</sup> after four

years it has not appeared, nor does it appear in principle to be capable of refuting Bassin's conclusion (see chapter 18).

*Claim 29: There is no evidence that fluoride lowers IQ.*

There have now been twenty-three published studies showing that moderate to high levels of natural fluoride in source waters are associated with a lowered IQ in children. While proponents point to weaknesses in some of the IQ study designs, what is truly impressive is the fact that, apart from one small study in New Zealand,<sup>15</sup> fluoridated countries have chosen not to replicate them. Moreover, these IQ studies are buttressed by over eighty animal studies that show that fluoride damages the brain, as well as three Chinese studies that show fetal brain damage in areas endemic for fluorosis (see chapter 15).

*Claim 30: There is no evidence that any individuals are particularly sensitive to fluoride's toxic effects.*

It would be far more accurate to state that governments practicing fluoridation have shown no interest in testing scientifically the many anecdotal reports from citizens (along with case studies published by a number of authors) that they are sensitive to fluoride. Patients complain of a number of symptoms that disappear when the source of fluoride is removed and return when the source is reintroduced (see chapter 13).

*Claim 31: Dental fluorosis is only a "cosmetic" problem.*

Dental fluorosis is the one condition caused by fluoride that proponents do not deny. However, they commonly claim that the condition is not a health effect but merely a cosmetic effect. Fluoridation opponents, on the other hand, maintain that dental fluorosis—the result of fluoride's interference with the growing tooth cells—is the first visible evidence that fluoride has had an adverse *systemic* effect on the body, and they wonder what other developing tissues may have been affected while the tooth cells were being damaged. Of particular concern are the skeletal system, the brain, and the endocrine system, where damage could be happening without visible telltale signs. Proponents offer no evidence that other tissues have not been affected while dental fluorosis is occurring.

Nor are cosmetic effects necessarily trivial. Moderate dental fluorosis, which involves discoloration of 100 percent of a tooth surface and affects over 1 percent of children living in fluoridated communities,<sup>16</sup> is likely to cause psychological damage to teenagers<sup>17</sup> (see chapter 11) and is very expensive to treat.

Of some pertinence are the CDC's stated objectives of the fluoridation program: "Adjusted fluoridation is the conscious maintenance of the optimal fluoride concentration in the water supply for reducing dental caries and *minimizing the risk of dental fluorosis*" [emphasis added].<sup>18</sup> Regardless of whether the CDC's first objective has been met, with 32 percent of American children now affected by dental fluorosis,<sup>19</sup> the second objective has clearly not been.

*Claim 32: Most cases of dental fluorosis are so mild that only a trained professional can recognize the problem.*

This may be true of some cases of the *very mild* condition of fluorosis, which impacts over 22 percent of children in fluoridated areas, but is certainly not true of the *mild* condition, which involves up to 50 percent of the tooth surface and affects 5.8 percent of children in fluoridated areas, or the *moderate* condition, which involves 100 percent of the tooth surface and affects over 1 percent of children in fluoridated areas<sup>20</sup> (see chapter 11).

*Claim 33: Some cases of dental fluorosis actually improve the appearance of the teeth.*

This claim dates back to a famously cynical comment made in 1951 by Dr. Frank Bull, the state dental director for Wisconsin. His remarks are quoted in full in chapter 11, under "Promoters' Spin."

*Claim 34: Skeletal fluorosis is very rare in fluoridated countries.*

It is difficult for promoters of fluoridation to deny that high natural levels of fluoride have caused severe bone damage in millions of people in India, China, and several other countries. However, proponents insist that skeletal fluorosis is a rare occurrence in countries with artificial fluoridation like the United States. What they really mean by this is that the crippling phase (stage III) of this condition is rare in the United States; they fail to recognize that the earlier phases (stage I and stage II) are associated with pains in the joints and bones, symptoms identical to the early symptoms of arthritis, a condition that affects many millions of adults in the United States (see chapter 17). The 2006 NRC review recommends that stage II skeletal fluorosis be considered an adverse effect: "The committee judges that stage II is also an adverse health effect, as it is associated with chronic joint pain, arthritic symptoms, slight calcification of ligaments, and osteosclerosis of cancellous bones."<sup>21</sup> No fluoridating country has undertaken a study to see if there is a relationship between fluoridation and arthritis (see chapter 17).

*Claim 35: Opponents use "scare tactics."*

In reality, the potential that fluoride might be causing a number of harms (including osteosarcoma in young men; arthritis and hip fractures in the elderly; lowered IQ in children; and lowered thyroid function) in some of the 400 million people who are drinking fluoridated water daily is indeed worrying (see chapters 10–19). The risks for one individual may be small, but if millions of people drink fluoridated water, a small risk multiplies up to a lot of cases. If we suppose a risk of some harm to 1 in 1,000, that would mean 400,000 cases worldwide or 10,000 in a large city.

*Claim 36: Opponents are "poison mongers."*

This bizarre claim originates from a piece of work authored by Dr. Stephen Barrett, a retired psychiatrist from Allentown, Pennsylvania, who started an organization called Quackbusters.<sup>22</sup> Another article (coauthored by Barrett) that makes the same silly charge is titled "Fluoridation: Don't Let the Poisonmongers Scare You."<sup>23</sup>

The notion that people opposed to putting a known toxic substance into the drinking water supply are "poison mongers" is *Alice in Wonderland* nonsense. Fluoridation opponents are not selling a poison; in fact, they are not selling anything. It is the proponents, or their friends in the phosphate fertilizer industry, who are doing just that. This is a classic ploy of propagandists: Accuse your opponent of doing exactly what you are doing, or simply take your opponents' arguments and turn them upside down.

*Claim 37: Opponents are "conspiracy theorists."*

This was true of one faction of the anti-fluoridation movement in the 1950s, whose members believed that fluoridation was a "communist plot," as parodied in Stanley Kubrick's famous movie *Dr. Strangelove*. However, even in those early days many reputable scientists were opposed to fluoridation on scientific grounds and many more on the very rational grounds that it is unethical to deliver medicine through the public water supply, because it removes the individual's right to informed consent to medical treatment. Today, there are still conspiracy theorists around, as there are in almost any field, but most opponents are increasingly well informed.

*Claim 38: Opponents are members of a fringe element who propagate discredited myths.*

It is true that a *few* people who oppose fluoridation do so based on claims that

Nazi Germany and other totalitarian regimes used it as a method of mind control. There is little evidence that would satisfy a historian to support such claims. The vast majority of fluoridation opponents repudiate such views and base their opposition on science and ethics.

*Claim 39: Over sixty countries practice water fluoridation.*

A large majority of countries in the world do *not* fluoridate their water. They include China, India, Japan, nearly all the European countries, and almost all the industrialized nations. Only about thirty countries have some percentage of their population drinking fluoridated water, and of those only eight have more than 50 percent of their population doing so (see chapter 5).

*Claim 40: The consensus of medical and dental professionals and scientists is that there is no valid debate on fluoridation.*

Nothing in science is beyond debate. As far as *consensus* is concerned, we are reminded of what the late Michael Crichton said:

I regard consensus science as an extremely pernicious development that ought to be stopped cold in its tracks. Historically, the claim of consensus has been the first refuge of scoundrels; it is a way to avoid debate by claiming that the matter is already settled . . . The greatest scientists in history are great precisely because they broke with the consensus . . . There is no such thing as consensus science. If it's consensus, it isn't science. If it's science, it isn't consensus. Period.<sup>24</sup>

Even if there are some areas of science where consensus seems legitimate, Crichton's statement is certainly relevant to the fluoridation debate.

### **Summary**

Proponents of fluoridation possess a wide repertoire of incorrect statements about the science and unfounded generalizations about those who disagree with them. We have reproduced and refuted some of the commoner ones in this chapter.

# Material Safety Data Sheet



## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

**Product Name:** SODIUM FLUORIDE

**Recommended Use:** Water fluoridation, steel degassing, wood and adhesive preservative, electroplating, glass manufacture, disinfectant.

**Supplier:** Orica Australia Pty Ltd  
**ABN:** 99 004 117 828  
**Street Address:** 1 Nicholson Street,  
Melbourne 3000  
Australia  
**Telephone Number:** +61 3 9665 7111  
**Facsimile:** +61 3 9665 7937  
**Emergency Telephone:** 1 800 033 111 (ALL HOURS)

## 2. HAZARDS IDENTIFICATION

This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

**Risk Phrases:** Toxic if swallowed. Contact with acids liberates very toxic gas. Irritating to eyes and skin.

**Safety Phrases:** Do not breathe dust. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).

**Poisons Schedule:** S6 Poison.

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Proportion	Risk Phrases
Sodium fluoride	7681-49-4	>=98%	R25, R32, R36/38

## 4. FIRST AID MEASURES

For advice, contact a Poisons Information Centre (e.g. phone Australia 131 126; New Zealand 0800 764 766) or a doctor at once. Urgent hospital treatment is likely to be needed.

### Inhalation:

Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice if effects persist.

### Skin Contact:

If skin or hair contact occurs, immediately remove any contaminated clothing and wash skin and hair thoroughly with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

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**Eye Contact:**

If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes.

**Ingestion:**

Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

**Medical attention and special treatment:**

Treat symptomatically.

## 5. FIRE FIGHTING MEASURES

**Hazards from combustion products:**

Non-combustible material.

**Precautions for fire fighters and special protective equipment:**

Decomposes on heating emitting toxic fumes, including those of hydrogen fluoride, and sodium oxide. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition.

**Suitable Extinguishing Media:**

Not combustible, however, if material is involved in a fire use: Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).

Hazchem Code: 2Z

## 6. ACCIDENTAL RELEASE MEASURES

**Emergency procedures:**

If contamination of sewers or waterways has occurred advise local emergency services.

**Methods and materials for containment and clean up:**

Wear protective equipment to prevent skin and eye contact. Avoid breathing in dust. Work up wind or increase ventilation. Collect and seal in properly labelled containers or drums for disposal.

## 7. HANDLING AND STORAGE

This material is a Scheduled Poison S6 and must be stored, maintained and used in accordance with the relevant regulations.

**Conditions for safe storage:**

Store in a cool, dry, well ventilated place and out of direct sunlight. Protect from moisture. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Keep containers closed when not in use - check regularly for spills.

**Precautions for safe handling:**

Avoid skin and eye contact and breathing in dust. Avoid handling which leads to dust formation. Keep out of reach of children.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Occupational Exposure Limits:** No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for constituent(s):

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Fluorides (as F): 8hr TWA = 2.5 mg/m<sup>3</sup>

As published by the National Occupational Health and Safety Commission.

TWA - The time-weighted average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

## Engineering controls:

Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

## Personal Protective Equipment:

The selection of PPE is dependant on a detailed risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Orica Personal Protection Guide No. 1, 1998: F - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.



Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b>	Powder or Crystals
<b>Colour:</b>	White or Colourless
<b>Odour:</b>	Odourless
<b>Molecular Formula:</b>	NaF
<b>Specific Gravity:</b>	2.78 @ 20°C
<b>Relative Vapour Density (air=1):</b>	1.45
<b>Vapour Pressure (20 °C):</b>	Not available
<b>Flash Point (°C):</b>	Not applicable
<b>Flammability Limits (%):</b>	Not applicable
<b>Autoignition Temperature (°C):</b>	Not applicable
<b>Solubility in water (g/L):</b>	40
<b>Melting Point/Range (°C):</b>	988
<b>Boiling Point/Range (°C):</b>	1695
<b>pH:</b>	7.4 (freshly prepared saturated solution)

Product Name: SODIUM FLUORIDE  
Substance No: 000031020001

Issued: 17/10/2008  
Version: 4

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## 10. STABILITY AND REACTIVITY

<b>Chemical stability:</b>	Stable under normal conditions.
<b>Conditions to avoid:</b>	Avoid dust generation.
<b>Incompatible materials:</b>	Incompatible with acids.
<b>Hazardous decomposition products:</b>	Hydrogen fluoride. Sodium oxide.
<b>Hazardous reactions:</b>	Hazardous polymerisation will not occur.

## 11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

<b>Ingestion:</b>	Swallowing may result in nausea, vomiting, and abdominal pain. Swallowing large amounts may cause muscle spasms, coma and death from respiratory failure.
<b>Eye contact:</b>	An eye irritant.
<b>Skin contact:</b>	Contact with skin will result in irritation.
<b>Inhalation:</b>	Breathing in dust may result in respiratory irritation.

### Long Term Effects:

Chronic fluorine poisoning is possible. Intake of more than 1.5 mg/L of fluoride can cause dental fluorosis with amounts of greater than 4 mg/L possibly causing skeletal fluorosis. Symptoms include weight loss, brittle bones, anaemia, weakness, and stiffness of joints.

### Toxicological Data:

Oral LD50 (rat): 31 mg/kg.  
Oral LD50 (mice): 44 mg/kg.

## 12. ECOLOGICAL INFORMATION

<b>Ecotoxicity</b>	Avoid contaminating waterways.
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## 13. DISPOSAL CONSIDERATIONS

### Disposal methods:

Refer to Waste Management Authority. Dispose of material through a licensed waste contractor.

## 14. TRANSPORT INFORMATION

### Road and Rail Transport

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail; DANGEROUS GOODS.

# Material Safety Data Sheet



**UN No:** 1690  
**Class-primary:** 6.1 Toxic  
**Packing Group:** III  
**Proper Shipping Name:** SODIUM FLUORIDE  
**Hazchem Code:** 2Z

## Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea; DANGEROUS GOODS.

This material is classified as a Marine Pollutant (P) according to the International Maritime Dangerous Goods Code.

**UN No:** 1690  
**Class-primary:** 6.1 Toxic  
**Packing Group:** III  
**Proper Shipping Name:** SODIUM FLUORIDE, SOLID

## Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air; DANGEROUS GOODS.

**UN No:** 1690  
**Class-primary:** 6.1 Toxic  
**Packing Group:** III  
**Proper Shipping Name:** SODIUM FLUORIDE

## 15. REGULATORY INFORMATION

**Classification:** This material is hazardous according to criteria of Safe Work Australia; HAZARDOUS SUBSTANCE.

**Hazard Category:** T: Toxic  
Xi: Irritant

**Risk Phrase(s):** R25: Toxic if swallowed.  
R32: Contact with acids liberates very toxic gas.  
R36/38: Irritating to eyes and skin.

**Safety Phrase(s):** S22: Do not breathe dust.  
S24/25: Avoid contact with skin and eyes.  
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.  
S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).

**Poisons Schedule:** S6 Poison.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

**Product Name:** SODIUM FLUORIDE  
**Substance No:** 000031020001

**Issued:** 17/10/2008  
**Version:** 4

# Material Safety Data Sheet



## 16. OTHER INFORMATION

'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2008.

This material safety data sheet has been prepared by SH&E Shared Services, Orica.

### **Reason(s) for Issue:**

Revised Primary MSDS

Alignment to HSNO requirements

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

## Izetta F. Grossman

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**From:** Kristy Walworth <kkwalworth@yahoo.com>  
**Sent:** Wednesday, July 03, 2013 3:28 PM  
**To:** Izetta F. Grossman; Nolan Young; Izetta F. Grossman  
**Cc:** tmac70@charter.net  
**Subject:** Factual Evidence that water fluoridation is harmful and does not help protect against tooth decay  
**Attachments:** 50-reasons.pdf; proponent\_claims.pdf; Sodium fluoride ORICA.pdf; sodiumfluoride.pdf; who\_opposes\_F.pdf

Hello,

My name is Kristy and I am a resident here in The Dalles and have been for some time now. I just read the letter sent by Jill Price from the Oregon Dental Association submitted for the upcoming city council meeting regarding water fluoridation and am disgusted at the blatant lies and disrespect for people's right to choose what to put in their bodies. I have attached actual information regarding the truth of water fluoridation to this email and kindly ask for you to review it seeing that no one, especially someone who doesn't even live in our city, gets to dictate putting drugs, and fluoride is a drug, into my body, my son's body or any persons living within The Dalles' body. If anyone says that they have a right to put this toxic substance into my body, I have a right to view their documentation proving that it is safe. Did she provide this information to you? I didn't read it in the letter. All I read was how someone in the position of perceived authority "says" that it is safe. Why did the people of Portland vote to keep it out of the water recently and why has it been voted down every time it has been attempted? It's because it is absolutely NOT safe. It is a drug and has very harmful affects. 97% of the European Union is not fluoridated and their rates of tooth decay are no different than the rates in fluoridated cities across the US. Fluoride has been linked to causing cancer, thyroid problems, lowering the IQ of children, bone disease, male infertility, as well as several other medical conditions. It has been

shown time and time again that the only way fluoride actually helps teeth is by TOPICAL application, not systemic. The CDC has even admitted to this. Please do not buy into what this person is trying to sell you just because she has a title behind her name and I do not. The information is widely available that counters everything she said in that letter. Fluoride is dangerous, it is affecting you and the people you love and are responsible for and the people I love and am responsible for. I do not consent to water fluoridation. I have included links in this email for your convenience. One is a half hour video giving the corrupt history of water fluoridation (which should be enough evidence in and of itself to have it removed) and a website that has compiled all data available about the health impacts of water fluoridation. Please take the time to review these. Thank you very much.

Fluoride Action Network  
[www.fluoridealert.org](http://www.fluoridealert.org)

The Fluoride Deception (Video)  
<http://www.youtube.com/watch?v=eBZRb-73tLc>



## 1) MOST OF THE DEVELOPED WORLD

Proponents of water fluoridation often present a long list of medical and dental organizations that officially endorse the fluoridation of water. What proponents fail to mention, however, is that very few developed countries have been convinced by this laundry list. In fact, over half of the world's population that drinks fluoridated water now lives in the United States. In western Europe, over 97 percent of the population drinks non-fluoridated water (and yet, their tooth decay rates are generally lower than the tooth decay rates in the U.S.).

## 2) NOBEL PRIZE-WINNING SCIENTISTS

Proponents of fluoridation like to claim that no one who opposes fluoridation is credible. A number of prominent Nobel Prize-winning scientists, however, have opposed the practice. One such scientist, Dr. Arvid Carlsson, won the Nobel Prize in Medicine/Physiology in 2000 for his research on neurotransmitters in the brain. In a 2005 interview, Dr. Arvid Carlsson noted that "fluoridation is against all modern principles of pharmacology. It's obsolete. I don't think anybody in Sweden, not a single dentist, would bring up this question anymore."

## 3) SCIENTISTS AT THE ENVIRONMENTAL PROTECTION AGENCY (EPA)

The Union of Scientists and Professionals at EPA's Headquarters Office, which represents over 1,500 scientists at EPA, has gone on record as opposing water fluoridation due to concerns about fluoride's health effects. According to the Union, "In summary, we hold that fluoridation is an unreasonable risk."

## 4) THOUSANDS OF MEDICAL AND SCIENTIFIC PROFESSIONALS

Over 531 medical doctors, 494 PhD scientists (including three co-authors of the National Research Council's landmark review on fluoride toxicity), 341 dentists, 573 chiropractors, 718 registered nurses, and 89 pharmacists have gone on record since 2007 as opposing water fluoridation.

## 5) KEY LEADERS IN THE ENVIRONMENTAL HEALTH COMMUNITY

Key figures in the environmental health community have also gone on record as supporting an end to water fluoridation. This includes the following environmental health leaders who have also called for an end to fluoridation since 2007:

- > **Rosalie Bertell**, PhD, Regent of the Board, International Physicians for Humanitarian Medicine, Geneva, Switzerland,
- > **Theo Colborn**, PhD, co-author, *Our Stolen Future*
- > **Ken Cook**, President, Environmental Working Group
- > **Pat Costner**, retired Senior Scientist, Greenpeace International
- > **Ron Cummins**, Director, Organic Consumers Association
- > **Ingrid Eckerman**, MD, MPH, President, Swedish Doctors for the Environment (LFM), Stockholm, Sweden
- > **Sam Epstein**, MD, author, "Politics of Cancer" and Chairman, Cancer Prevention Coalition
- > **Jay Feldman**, Executive Director, Beyond Pesticides
- > **Lois Gibbs**, Executive Director, Center for Health, Environment, and Justice
- > **Andy Harris**, MD, Former National President, Physicians for Social Responsibility
- > **Vyvyan Howard**, MD, PhD, Past President, International Society of Doctors for the Environment
- > **Stephen Lester**, Science Director, Center for Health, Environment, and Justice
- > **Peter Montague**, PhD, Director of Environmental Health Foundation
- > **Ted Schettler**, MD, Science Director, Science and Environmental Health Network
- > **FIVE Goldman Prize winners** (2006, 2003, 1997, 1995, 1990)



## 6) CIVIL RIGHTS LEADERS

In light of evidence showing that fluoridation disproportionately harms low-income communities and communities of color, civil rights organizations and leaders have also begun calling for an end to fluoridation. This includes:

- > **LULAC**, the largest Hispanic civil rights organization;
- > **Andrew Young**, the former Mayor of Atlanta and Ambassador to the United Nations;
- > **Dr. Gerald L. Durley**, a clinical psychologist, environmentalist, and Pastor of the Providence Baptist Church in Atlanta;
- > **Reverend Bernice King**  
(the daughter of Dr. Martin Luther King).

## 7) THE ULTIMATE CONSUMER ADVOCATE, RALPH NADER

No one has done more to protect the American consumer over the past 50 years than Ralph Nader. It should be of little surprise, therefore, that Nader opposes mandatory fluoridation laws.

## 8) THE MAJORITY OF COMMUNITIES IN NORTH AMERICA

When given the opportunity to decide, the majority of communities have consistently rejected water fluoridation. As Dr. Edward Groth noted in his PhD dissertation for Stanford University:

*"The fact that nearly 3 out of every 5 communities which vote on the issue have rejected fluoridation, year after year, does in all likelihood represent a collective judgment on the part of the public that, when all things are considered, fluoridation is not an acceptable public health measure."*

Although Groth wrote this back in 1973, the trend has largely remained the same. Fluoridation spread rapidly through the United States, not by public demand, but by the executive actions of government bodies. As noted by Dr. James Dunning, of the Harvard School of Dental Medicine, "The big cities in the United States were mostly fluoridated by executive action in such a way as to avoid public referenda."

## 9) OVER 50 COMMUNITIES SINCE 2010

Since 2010, over 50 North American communities, with more than 2 million residents, have rejected water fluoridation, with over 30 of these communities voting to END longstanding water fluoridation programs. This includes:

- > Pinellas County, Florida (pop. 700,000)
- > Albuquerque, New Mexico (pop. 500,000)
- > Moncton, New Brunswick, Canada (pop. 140,000)
- > College Station, Texas (pop. 100,000)
- > Fairbanks, Alaska (pop. 80,000)

As the New York Times recently described:

*"For decades, the issue of fluoridated water remained on the fringes. . . . But as more places, like Fairbanks and parts of Canada, take up the issue in a more measured way, it is shifting away from conspiracy and toward the mainstream. The conclusion among these communities is that with fluoride now so widely available in toothpaste and mouthwash, there is less need to add it to water, which already has naturally occurring fluoride. Putting it in tap water, they say, is an imprecise way of distributing fluoride; how much fluoride a person gets depends on body weight and water consumed."*



## 10) NATURE

Fluoridation proponents like to say that “nature thought of fluoridation first.” To support this, they note that some water supplies naturally contain fluoride at the levels that are added to water in artificial fluoridation programs. What proponents fail to appreciate, however, is that although fluorine is the 13th most abundant element in the Earth’s crust, the vast majority of fresh surface water, and the vast majority of plants (e.g., fresh fruit, grains, and vegetables), eggs, and milk, contain very low levels of fluoride. Most tellingly, human breast milk — which provides all of the nutrients a rapidly growing baby needs for healthy growth and development — specifically excludes fluoride, so that breast-fed infants have virtually no exposure to fluoride.

So, yes, nature did think of fluoridation first: it thought about it and, like the majority of humans today, decided that exposing living tissues to a compound with no essential role in human, animal, or plant nutrition, is a pointless, unnecessary risk.

FOR MORE INFORMATION, SEE:  
[WWW.FLUORIDEALERT.ORG](http://WWW.FLUORIDEALERT.ORG).