The WDDTY Dental Handbook

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Contents

Introduction

Completely updated and revised, this new and much improved booklet represents a distillation of all the evidence that **What Doctors Don't Tell You** has amassed about the dangers of amalgam fillings and fluoride. There is also advice on what you can do to protect yourself.

Until recently, the British and American dental societies have steadfastly maintained that the mercury contained in amalgam fillings is perfectly safe.

Although a number of groups and individuals have noisily protested this medical party line for years, they have been dismissed as hysterics—until, that is, the recent publication of the work of several prestigious scientists and academic centres essentially supported their position.

Researchers from the Department of Medicine, the University of Calgary in Alberta, Canada, for one, have spent a decade studying the effects of amalgam on various animals and their offspring. Their work conclusively proves that mercury from amalgam fillings migrates to tissue in the body, causing harm. Although the extent of the risk isn't yet known, the research carried out thus far points to a possible role of mercury in the development of chronic conditions such as candidiasis, myalgic encephalomyelitis (ME) and even Alzheimer's disease.

As for fluoride, the problem is one of massive overconsumption. We are being bombarded with fluoride in all our dental products and also from many industrial sources, and the latest evidence shows a number of risks—from cancer to brittle bones.

As with most of our stories in **WDDTY**, we have avoided conjecture in favour of published scientific papers or clinical evidence showing actual risk. That places us squarely in line with the University of Calgary team, which declares that, while risk is present, all the facts aren't in yet.

Let us emphasise: not everyone needs to have their metal fillings replaced. Tests are available to determine whether you have a toxic load of mercury. If you do decide to take them out, it is vital that you follow

the right protocol or you could become more ill than you were before.

Towards that end, we've compiled a list of UK, US and Canadian dentists experienced in removing mercury and working with non-metal fillings. We offer them without endorsement as possible first ports of call.

Our thanks go to the late Jack Levenson and Hal Huggins, dentists whose pioneering work opened up the mercury-free debate. Their advice and support is much in evidence throughout this booklet. Our thanks also go out to journalists Fiona Bawdon, Anne-Lise Gotzche and Doris Jones for their contributions to our section on fluoride, and to Dr Huggins for his work on root canals.

Lynne McTaggart

1
Root Causes

The health of our teeth is not just an indicator of our overall health, but may be a direct cause of chronic illness, as suggested by new studies published over the last few years.

Oncologists and heart specialists rarely bother to look at the state of their patients' teeth and gums—and yet, a growing body of research has discovered that that's the very first place they should be looking. Researchers are discovering that gum diseases such as gingivitis, when the gums become inflamed and bleed, and the more severe periodontal disease, which can even attack the jawbone, are not only indicators of systemic and chronic disease, but may also be a significant, and unsuspected, cause of the disease. The association is being made with a range of health problems, including diabetes, cancer, heart disease, birthing problems and mental decline. Indeed, the health of our teeth and gums may even determine how long we live.

Although this breakthrough discovery has occurred only in the past few years, the idea that the health of our teeth and gums can be directly linked to specific diseases was most famously mooted by Dr Weston A. Price (1870–1948) around 60 years ago.

Price, who was appointed the first research director of the American Dental Association in 1914, also argued that root-canal fillings caused the leakage of bacteria that, he believed, could lead to arthritis and other autoimmune diseases. Researchers, however, were unable to find any such association when they followed up on the theory 20 years later (J Am Dent Assoc, 1951; 42: 615–97).

Price's work, which was summarised in his book Nutrition and Physical Degeneration (La Mesa, CA: Price-Pottenger Nutrition Foundation, 2008), first published in 1939, was one of the inspirations for the field of holistic dentistry, which promotes the theory that dental health determines overall health. Nevertheless, until recently, it was practised with very little supportive evidence.

In spite of this, holistic dentists have had a champion in Dr Robert Genco, professor of oral biology at the State University of New York in Buffalo, and editor of the Journal of Periodontology.

As Dr Genco says: "Patients think of gum disease in terms of their teeth, but they don't think about the fact that gum disease is a serious infection that can release bacteria into the bloodstream. The end results could mean additional health risks for patients whose health is already affected by other diseases, or lead to serious complications such as heart disease."

What came first?

Critics of the theory argue that the health of our teeth and gums is merely symptomatic of our overall health, and inflamed and bleeding gums are a sign of a compromised immune system that, in turn, can lead to systemic illnesses. It's something that especially affects people from poor communities, where personal welfare and a good diet are not always possible.

A study of 282 poor people living in villages in Vukovar, Croatia, confirmed that socioeconomic factors are a significant cause of periodontal disease, but it also raised another factor—stress. The research team, from the University of Zagreb, questioned the villagers about their health and dental care in the five years following the end of World War II, and determined that stress suffered by those during the war and directly afterwards was a "significant risk factor" for periodontal disease (Eur J Med Res, 2008; 13: 100–6).

The socioeconomic argument was also used recently by Cancer Research UK in response to a study which suggested that gum diseases may be associated with a 14-per-cent increased risk of any type of cancer. The group's health information manager Hazel Nunn said:

"This study doesn't confirm whether it is gum disease or other factors that are causing this increase in risk. Deprivation may play a role as people from deprived backgrounds are more likely to have both poor dental health and poor overall health" (The Daily Telegraph, 26 May 2008).

But an important meta-analysis from the Harvard School of Public Health revealed that the association was still evident even after allowing for poverty and deprivation. This led the researchers to conclude that "these associations [between periodontal disease and systemic illnesses such as cancer] persist after adjustment for major risk factors,

including cigarette smoking and socio-economic status" (Cancer Causes Control, 2008; e-pub 14 May 2008, ahead of print).

In fact, this conclusion has been supported by other reports that involved, as part of their scientific methodology, adjustments for confounding factors such as lifestyle—including smoking and drinking—as well as a review of the patient's history of the disease and socio-economic status.

In fact, several researchers have gone even further. Not only are they willing to state that there is an association between the health of the mouth and gum disease, but they are also echoing Dr Price's hypothesis that periodontal problems may well be a direct cause of other systemic illnesses.

The inflammation theory

Some dentists who accept the association between gum health and systemic disease nevertheless argue against the cause-and-effect theory. Instead, they believe that the common factor between cardiovascular disease in particular and gum health is an inflammatory disorder, which may simply be affecting both parts of the body at the same time (Oral Dis, 2008; 14: 102–4).

This idea appears to be supported by a study from the University of North Carolina that reviewed the health of 775 women who were, at most, 26 weeks into pregnancy. Of these, 31 went on to develop preeclampsia (pregnancy-induced high blood pressure, with protein in the urine and swelling due to fluid retention)—and most of these women also had advanced periodontal disease. They also had high levels of C-reactive protein, a marker of inflammatory disease (Am J Obstet Gynecol, 2008; 198: 389).

Also, there appears to be some association between periodontal disease and other inflammatory conditions such as endometriosis and rheumatoid arthritis. In one study of 4136 women suffering from endometriosis, researchers discovered that 57 per cent also had gingivitis and periodontal disease. Overall, they concluded that gum disease had evidently increased the risk of endometriosis (Fertil Steril, 2008; 2 April 2008, e-pub ahead of print).

Researchers found a similar connection among rheumatoid arthritis sufferers. In a study of 39 patients in Brazil, they found that the typical patient had fewer teeth, and higher levels of dental plaque and gum

disease, than found in the general, non-rheumatic population (Braz Oral Res, 2008; 22: 72–7).

However, researchers from the University of Marseille in France discovered that periodontal disease is a factor of coronary artery disease that is independent of inflammation. When they used coronary angiography to evaluate 131 heart patients, they found a direct link between the severity of periodontal disease and the presence of cardiovascular disease, irrespective of C-reactive protein levels and inflammation (J Intern Med, 2008; 263: 644–52).

Periodontal disease and the heart

The tide only began to turn in favour of holistic dentistry as recently as 2005, when a landmark study discovered that people with gum disease were more likely to develop atherosclerosis, or narrowing of the arteries. American researchers at the University of Minnesota took samples from the mouths of 657 healthy volunteers, and found that early signs of atherosclerosis were present in those who were carrying the type of bacteria that cause periodontal disease, a problem that affects up to half of the US population to some degree. The study found that the early signs of atherosclerosis were greatest in those who had 11 or more strains of the bacteria known to cause periodontal disease (Circulation, 2005; 111: 576–82).

In another study carried out to investigate 161 patients, aged 40 to 75 years, with severe angina pectoris and to compare them with 162 healthy controls, researchers found that those with severe periodontal disease were nearly six times more likely to also suffer from chronic heart disease, even after controlling for age and smoking (J Clin Periodontol, 2008; 35: 199–205).

Periodontal disease and cancer

The health of our teeth and gums may also determine whether or not we develop cancer. A recent study suggests that people with persistent gum disease have a 14-per-cent higher risk of developing tumours of any sort.

The research team, from Imperial College London, made the discovery after tracking the health of 48,375 men for an average of 17.7 years. Of the 5720 men who developed cancer during that period of time, the scientists found that persistent periodontal disease, including gingivi-

tis, increased the risk of kidney cancer by 49 per cent and pancreatic cancer by 54 per cent.

However, the team was unable to establish whether or not gum disease was the actual cause of the cancers or was, instead, only an indicator of an impaired immune system in general, possibly as the result of poverty or poor living conditions (Lancet Oncol, 2008; 9: 550–8).

Periodontal disease and diabetes

Researchers have also concluded that periodontal disease may well be a predictor—and possibly even a cause—of type 2 diabetes, usually considered to be a lifestyle disease.

Scientists at Columbia University in New York tracked the health of 9296 participants who did not have diabetes at the start of the study. After 21 years of follow-up, 53 per cent had developed periodontal disease to some degree, which was classified as level 1 to 5 in terms of severity. While a diabetes risk was not detected in those with early-stage levels 1 or 2, those with more advanced periodontal disease (levels 3 to 5) were more than twice as likely to become diabetic. In addition, participants who had lost some of their teeth were 1.7 times more likely to have diabetes (Diabetes Care, 2008, e-pub 4 April 2008 ahead of print).

In a study of 52 pregnant women, researchers from the Johannes Gutenberg University in Mainz, Germany, found a direct correlation between periodontal inflammation and type 1 (insulin-dependent) diabetes. Those who needed higher doses of insulin were also the ones who had more severe periodontal problems (Coll Antropol, 2008; 31: 115–8).

Periodontal disease and birthing problems

The state of teeth and gum disease appear to affect birth outcomes, an association that is more apparent in developing countries where oral health in impoverished communities is more likely to be poor. Researchers at the Aga Khan University in Karachi, Pakistan, estimate that a woman is 1.3 times more likely to experience a birth complication—such as preterm delivery, low birth weight or still-birth—if she has severe periodontal disease.

They arrived at this conclusion by assessing the dental records of 1152 women who were at least five months pregnant. Of these, 76 per cent had periodontal disease, and there was a direct association between the severity of the disease and the risk of problems at birth.

The researchers concluded that gum disease is a direct cause of birthing problems, and not merely an indicator of general poor health that may lead to a difficult birth (Am J Obstet Gynecol, 2008; 198: 514).

Periodontal disease may also be a cause of preterm delivery, researchers from the University of Sassari, in Italy, have suggested. "There is emerging evidence of a possible relationship between maternal periodontal diseases as a potential risk factor of adverse pregnancy outcomes, like preterm low birth weight," they concluded (Minerva Stomatol, 2008; 57: 233–50).

Periodontal disease and pneumonia

People who complain of having a 'sticky mouth', one symptom of gum disease, are known to be twice as likely to develop pneumonia. A group of 4139 Japanese adults, aged 40 to 79, filled out a questionnaire that identified periodontal disease from a range of descriptions such as 'sensitive teeth', 'difficulty in chewing tough food substances' and 'mouth feels sticky'. Aside from the direct association with pneumonia, gum disease may also be related to cardiovascular disease, again independently of socioeconomic factors (J Dent Res, 2008; 87: 485–9).

Periodontal disease and mortality

Healthy gums and teeth can also determine our degree of disability in older age and even how long we are likely to live. In a study of 573 individuals aged 70 in 1984, researchers discovered that those who had no teeth, or had between one and nine teeth, went on to suffer disability at ages 75 or 80. Those who were completely tooth-less were also 1.26 times more likely to die within the next 21 years than those who still had more than nine teeth at age 70. The study authors, from the University of Copenhagen, concluded that tooth loss is "independently associated" with disability and mortal-ity (J Am Geriatr Soc, 2008; 56: 429–35).

Periodontal disease and mental decline

One study found a direct correla-tion between oral health and mental cognition. Researchers from West Virginia University in the US examined the dental health of 1984 adults living in care commu-nities, and found that those who had lower cognitive scores also had a higher number of decayed and missing teeth—and more periodontal problems. Using a scoring system to establish cognitive ability, the scientists

found that the mental score decreased one point for every missing tooth or level of periodontal problems (J Gerontol A Biol Sci Med Sci, 2008; 63: 495–500).

Researchers at New York University have even proposed the theory that Alzheimer's disease may be linked to periodontal disease. They suggest that treating a patient's gum disease may help to modify and control the onset and progression of Alzheimer's (J Alzheimers Dis, 2008; 13: 437–49).

An holistic way forward

Understanding the significance of gum disease as a cause of other serious disease may be one of the most significant breakthroughs in healthcare in years. While socio-economic factors and the general inflammation theory may explain some cases, there is nevertheless enough evidence to support Weston Price's initial idea that periodontal problems are an independent and direct cause of many chronic and systemic diseases.

Although more research is always valuable, the correlation has now been established beyond reasonable doubt. This means that it's now time for doctors to start changing the way they approach disease, especially heart problems and diabetes.

2
Mercury Falling

In the United States today, President Obama's lasting legacy in terms of healthcare reform may be rather different from that which he had intended.

While his attempts to broaden the scope of healthcare in the US, by making it, among other things, more affordable for everyone, continue to face mounting protest, he is nevertheless unwittingly in the vanguard of a movement that is expected to result in the restriction—and eventually the worldwide ban—of amalgam dental fillings.

Amalgam, or so-called 'silver', fillings contain mercury, the most toxic substance in the world and, as such, these tooth preparations have been associated with a range of chronic diseases—especially neurological and cognitive problems—from the time that they were first used more than 150 years ago.

These preparations are also suspected of being responsible for chronic degenerative diseases, such as Alzheimer's and multiple sclerosis. Mercury from amalgam vapours binds to tissues and has been detected in the brain years after a filling has been fitted.

Yet, despite these serious concerns—and the growing body of evidence that demonstrates the damage to our health in general that they cause—the British and American dental associations have persisted in blocking every move to ban the use of amalgam fillings while continuing to claim that they are safe.

Indeed, in the US, any dentist who recommends the removal of amalgam fillings for health reasons in general, or specifically for a given patient, can be barred from practising.

In addition, America's drugs watchdog and regulator, the Food and Drug Administration (FDA), has always supported the American Dental Association's strategy of blanket denial.

Dental flip-flops

Yet, in an extraordinary *volte face* in 2009, the FDA stated that amalgam fillings were safe except in that 3 per cent of patients who have a mer-

cury allergy.

On the other hand, it then went on to strengthen the position of amalgam manufacturers by allowing them to conceal from patients the fact that amalgam contains mercury.

Statements posted by FDA officials on its website just a year earlier had declared that amalgam fillings "may have neurotoxic effects on the nervous systems of developing children and fetuses". In addition, its own scientific advisory committee had recommended an immediate ban of the use of amalgam fillings in pregnant women and in children under the age of six.

Not surprisingly, anti-amalgam lobby groups smelled a rat. Indeed, the FDA's new commissioner, Dr Margaret Hamburg, who had joined just two months before the official decision was made, had been—just prior to her appointment—a member of the board of directors and a shareholder in Henry Schein Inc., America's major manufacturer of amalgam fillings.

However, there are powers at play even greater than the British and American dental associations—or even the FDA. President Obama has signed America up for the United Nation's Global Mercury Partnership, which seeks to ban the mining and stockpiling of mercury, which it describes as a "poisonous pollutant".

Although the Partnership's principal targets are its use in industrial processes, the UN cites amalgam fillings in its list of products that contain mercury—a list that also includes batteries, thermostats, lamps and thermometers—against which it is seeking a more cautious approach. The UN is also attempting to reduce environmental waste.

Around 55 per cent of all mercury in commercial use today is in the mouths of patients who have been given amalgam fillings. In total, around 1088 tonnes of mercury are in filled teeth in the US in 2004 alone, and 34 tonnes are added to that total each year through new fillings (Environmental Protection Agency International Mercury Market Study, cited in the Mercury Policy Project, Current Status of US Dental Mercury Reduction Initiatives, October 12, 2007).

Both the European Union and the US are expected to adopt the Partnership's final recommendations, as will every one of the other 150 participating nations.

The most conservative response will be to only ban the use of amalgam fillings in those who are mercury-allergic or pregnant, and in chil-

dren under six years of age. However, the EU may go further and impose a total ban of its use, as has already happened in Sweden, Norway and Denmark.

As a result, the British Dental Association would be overruled, and all dentists in the UK and Ireland would have to stop using amalgam fillings in everyone.

In the US, six states have so far introduced 'informed consent' legislation, where the dentist must tell the patient that so-called 'silver' fillings contain mercury. Last October, the city council of Costa Mesa in California passed a resolution in which it "requests" that all dentists in the city voluntarily stop using amalgam fillings. The council has also called upon the other 33 cities in Orange County to issue a similar edict.

Are dentists from Mercury?

Around a third of all dentists in the US already offer alternatives to amalgam, and a similar pro-portion probably does so in the UK, too. However, far fewer claim to be totally 'mercury-free'—or, if they are, they are keeping a very low profile about it. The UK's Society for Mercury-Free Dentistry lists only 52 dentists in the UK and Ireland combined who do not use amalgam, which is an extremely tiny proportion of the 24,000 dentists registered in the UK as a whole.

While many dental professionals may not want to work with mercury fumes every day, few are prepared to speak out against amalgam fillings and, in effect, their dental associations, which have maintained a fearsome defence of amalgam fillings for more than a century.

In fact, the American Dental Association (ADA) came into being only because the country's first organization for the dental profession—the American Society of Dental Surgeons, founded in 1840—refused to allow its members to work with mercury, so concerned was the Society about the health hazards of the metal.

Since then, the ADA and its UK counterpart, the British Dental Association, have maintained that the mercury found in fillings is rendered harmless, as it is combined with the silver, tin and copper that are also included in amalgam. Liquid mercury is then used to bind these metals, and it's this form of mercury that makes up around half of the filling's actual contents.

Vapours are released from the elemental mercury (Hg) used in the

fillings whenever we chew food or brush our teeth. And no one is disputing that high levels of mercury vapour are dangerous, and can affect the brain and kidneys in particular, although the dental and health associations maintain that fillings emit very low amounts that are harmless.

If dental associations are evidently cavalier about the impact of these fillings on patients' health, they might at least be more concerned over the wellbeing of its own membership, as there's plenty of evidence to suggest that they should be.

One study of 106 dentists discovered that all of them had very high levels of mercury in their urine compared with 94 general practitioners, who are not exposed to such vapours on a daily basis. The dental surgeries themselves were also found to have abnormally high levels of mercury vapours in their immediate environment. The researchers, from Shiraz University in Iran, noted that neuropsychological, respiratory, cardiovascular, skin and muscle problems were more frequent in dentists than in the general population (Ind Health, 2010; December 16; e-pub ahead of publication).

In addition, in Norway, a small study of dental assistants who had been working in surgeries from before the country banned amalgam fillings in 2008 found them to have "significantly higher" levels of neurological problems, such as memory loss, inability to concentrate, fatigue and sleep disturbances, compared with hospital nurses (J Occup Med Toxicol, 2008; 3: 10).

Indeed, dental nurses—who are usually the ones who have to handle the liquid mercury to make the amalgam—are clearly at the sharp end, as another study has discovered. Their levels of mercury were far higher than those of the dentists, despite the fact that they were often sharing the same surgery. Nevertheless, both the dentists and their assistants had levels higher than those found in the general population. What's more, the study also found that the mercury was having a negative effect on thymus gland function, the researchers noted (Toxicol Ind Health, 2009; 25: 159–67).

Moreover, dentists had four times the levels of mercury in their urine compared with the general population, according to one study of 180 dentists and a similar number of controls. In that study, the researchers also noted that dentists were "significantly more likely" than the controls to suffer from disorders of the kidney and from mem-

ory lapses (Occup Environ Med, 2002; 59: 287–93).

Women and children first

According to the world's dental associations, mercury fillings pose no risk to human health. Yet, at the same time, they accept that dentists should exercise caution in their use of these preparations in those who have mercury sensitivity, in women who are pregnant and in children under the age of six. Although it has yet to introduce a total outright ban, Germany has already barred the use of amalgam fillings in the latter two groups.

Mercury vapours from amalgam fillings can pass through the blood–brain barrier and affect the developing fetus, a study of 99 mothers has discovered. The amount of mercury found in both the maternal and cord blood correlated with the number of amalgam fillings the mother had, researchers from the Slovak Medical University in Bratislava discovered (J Expo Sci Environ Epidemiol, 2008; 18: 326–31).

In addition, the association between the number of amalgam fillings and levels of mercury in the body continues well into childhood. In one study of 507 children, aged between eight and 10 years, who had amalgam fillings in their mouths for up to seven years, the researchers discovered "a strong, positive" association between levels of mercury in the urine, and the number of amalgam fillings and the duration of time they had been in the teeth. It was also found that girls had much higher mercury levels than boys, even though the number of fillings was around the same in both genders (Environ Health Perspect. 2007; 115: 1527–31).

Researchers from the Institute of Chronic Illnesses Inc. in Silver Spring, MD, made a similar discovery when they re-analyzed data from a study that had examined the impact of amalgam fillings on mercury levels in adults. While the earlier study had found no association in the adults, the link between the fillings and mercury levels in these adults' children was marked. Overall, having an "average" number of amalgam fillings—which was not defined in the report—could increase mercury levels in children by up to 10 per cent.

"Dental amalgams are a significant chronic contributor to the mercury body burden", the researchers concluded (Biometals, 2010; November 5; e-published ahead of publication).

Conversely, researchers in Germany discovered that the overall level

of mercury has been declining since its nationwide ban of the use of amalgam fillings in children. In 2000, levels had dropped by around two-thirds compared with mercury levels taken in 1992, say researchers (Gesundheitswesen, 2003; 65: 327–35).

So, how does mercury affect the health of children once it's present in their bodies? One study of 534 children, aged between six and 10 years, discovered that the metal affects IQ levels and kidney function.

Also, mercury was detected in some of the children as long as five years after they first had an amalgam filling, said researchers from the Sahlgrenska University Hospital in Sweden (Environ Health Perspect, 2008; 116: 394–9).

How much is safe?

Individuals with amalgam fillings are absorbing up to 17 mcg/day of mercury, as estimated by the World Health Organization (WHO) in its 1991 report Environmental Health Criteria 118. A more recent estimate puts the intake at slightly lower at 12 mcg/day from amalgam fillings (Arch Environ Health, 1994; 49: 384–94), although those with a mouthful of fillings could be absorbing up to 100 mcg/day (FASEB J, 1995; 9: 504–8).

Our immune systems can handle up to 2.4 mcg/day of mercury before we begin to feel any ill effects, says the US Agency for Toxic Substances and Disease Registry, based in Atlanta, GA. However, the US Environmental Protection Agency (EPA) considers the tolerance level to be slightly higher—at 3.84 mcg/day (U.S. Environmental Protection Agency. Health Effects Assessment Summary Tables. FY 1997 Update. Office of Research and Development, Office of Emergency and Remedial Response, Washington, DC; EPA/540/R-97-036, 1997).

Canada's health authority, Health Canada, is more conservative, and puts the tolerable level at around only 1 mcg/day (Health Canada, Assessment of Mercury Exposure and Risks from Dental Amalgam, 1995).

In fact, the effect is cumulative. Although mercury vapours stay in the blood for only three days, they bind to cell structures in organs and especially in the brain, where traces of mercury have been found for up to 18 years after the fitting of an amalgam filling (Neurotoxicology, 2001; 22: 577–92).

Fish and the red herring

Defenders of amalgam fillings sometimes accuse critics of bad science.

They point out that mercury from fish is different from the mercury from amalgam fillings, while also claiming that it's more toxic and dangerous.

Mercury comes in three forms:

- *methyl*, from fish, especially oily fish such as tuna and salmon;
- *phenyl*, from amalgam fillings and the linings of nappies (diapers);
- *alkyl*, from fungicides used for wheat and other agricultural produce.

As such, eating fish and having a mouthful of amalgam fillings doesn't necessarily add to your mercury 'load'—but they are wrong to underplay the importance of amalgam. It is, by far, the most common source of mercury overload in the body, and phenylmercury—from amalgam—is the most neurotoxic of the three forms of the metal. Other useful facts include the following.

- Our body absorbs more mercury from our amalgam fillings than from any other source, including fish. Around two-thirds of the mercury in the human body comes from our fillings (FASEB J, 1992; 6: 2472–6).
- Around 80 per cent of the phenylmercury we inhale from amalgam vapours gets into the bloodstream and, from there, into the body's tissues, including the brain (Acta Pharmacol Toxicol, 1965; 23: 250–62).
- Phenylmercury from amalgam stays in the body far longer than does the methylmercury from fish. One study involving pregnant women who ate fish seven times a month could find no traces of methylmercury in hair and blood samples, but did find high levels of phenylmercury—and the levels increased with the number of amalgam fillings (Environ Health Perspect, 2003; 111; 637–41).

  Other studies have come to similar conclusions: those with amal gam fillings have up to five times higher concentrations of mecury in blood and urine samples, and up to 12 times higher mercury levels in organ tissues (J Dent Res, 1998; 77: 461–71).
- Methylmercury from fish is far less toxic than phenylmercury, which may be up to 20 times more dangerous (Science, 2003; 301: 1203).

Why take the risk?

Mercury is the most toxic metal known to man. We have all probably

already absorbed more mercury from our fillings than is safe. Even though some critics argue that our teeth are releasing levels of mercury that are far too low to affect our health, the truth is that there is no safe level when it comes to mercury.

This view is supported by the WHO, which maintains that there is no such thing as a 'safe level' for mercury, or a no-observed-effect level (NOEL), according to its Environmental Health Criteria 118 (see www.inchem.org/documents/ehc/ehc/ehc118.htm).

And the UK's Health and Safety Executive agrees. In its own statement, mercury vapour is described as "highly toxic" at any level, and it urges dentists to use "less hazardous substitutes . . . whenever possible".

Although amalgam fillings have been in use for more than 150 years, no health agency has ever assessed their safety. Indeed, America's FDA approved its use as part of its so-called 'grandfather' procedure, which grants automatic approval to drugs and devices that have been in continuous use since before 1976.

However, there are other compelling reasons for dental associations to deny that there are any health risks with the use of amalgam.

- *Convenience*. Amalgam is relatively inexpensive, it is durable and it is very easy to work with. Alternatives, such as composites and porcelain inlays, hit the pocket of the dentist harder, and they will last for only half the life of an amalgam filling, which can remain in the tooth for around 10 years. Using non-amalgam fillings will double the effort and expenses for the dentist.
- *Capacity*. Declaring amalgam fillings as unsafe would trigger the greatest health panic of all time, overwhelming dentistry everywhere around the world. Virtually everyone would want their amalgam fillings removed, and dentists would be unable to cope. According to the ADA, in 2009, more than 100 million Americans had amalgam fillings in their teeth.
- *Lawsuits*. It is imperative for dental associations to maintain their party line claiming the safety of amalgam fillings, as any admission that they are harmful would spark an investigation into the time they have 'sat' on the discovery, and could herald a spate of lawsuits, especially from people suffering from cognitive and

> neurological problems. Despite insisting that amalgam fillings are safe, the ADA has also declared that it "owes no legal duty of care to protect the public from allegedly dangerous products used by dentists".

In an interview with the present author on 6 January, 2011, consumer lobbyist Charlie Brown, of Consumers for Dental Choice (CDC), summed the situation up more prosaically. "Dentists just want to make quick and easy profits, and get out on the golf course."

However, the CDC points out that the position of the ADA, as well as those of other dental associations, is confusing. While its public statements have been insistent that amalgam is safe, the ADA has admitted, in various comments and documents over the years, that the fillings can affect health.

The CDC has collated these comments, which show that, in summary, the ADA has stated that amalgam fillings can cause:

- tremors
- depression and fatigue
- inability to concentrate
- loss of memory
- insomnia
- nausea
- birth defects
- nephritis and kidney disease
- pneumonitis
- swollen glands
- mouth ulcers.

For the consumer, the decision is clear: as there are alternatives that are safe and available, why take the risk with amalgam?

3
Heavy Metal

The American Dental Association continues to maintain, as it did in 1984, that: "When mercury is combined with the metals used in dental amalgam, its toxic properties are made harmless". This is the same position adopted by the British Dental Association. However, up until now, this position has been based upon reverse logic: amalgam fillings are safe until proven dangerous.

Dangers of mercury

In 1993, the US Public Health Service issued a report evaluating the safety of dental amalgam. Although the report allowed that small amounts of mercury vapour are released from your fillings and can be absorbed into the body, and that these could cause small responses in that rare group of allergic individuals, it concluded that: "There is scant evidence that the health of the vast majority of people with amalgam is compromised, nor that removing amalgam fillings has a beneficial effect on health" (JAMA, 1993; 269: 2491).

The American Food and Drug Administration's position continues to be that there are no valid data to demonstrate clinical harm from amalgam fillings to patients or that having them removed will prevent adverse health effects or reverse the course of existing diseases (JAMA, 1991; 265: 2934).

However, many reputable scientists have discovered further devastating proof that amalgam fillings can make you, your dentist—and even your unborn babies—ill.

Without a doubt, mercury is extraordinarily toxic to humans. The late Jack Levenson, while president of the British Society for Mercury-Free Dentistry, led the fight against amalgam poisoning in the UK. According to him, the well-respected toxicity centre at the University of Tennessee, which rates poisons according to their lethal toxicity to humans, scores

mercury at 1600, compared with plutonium, the most deadly, at 1900. This rating places it among the most toxic substances known to man.

Levenson compiled studies showing that dentists themselves show overwhelming evidence of poisoning in the form of high concentrations of mercury in the pituitary glands and twice the expected number of brain tumours (Br J Industr Med, 1991; 48: 729–34); female dentists and personnel are three-and-a-half times more likely to suffer from sterility, stillbirth and miscarriage (Int Arch Occup Environment Health, 1987; 59: 551–7), and all employees have a higher incidence of cancers of the brain, and heart, lung and kidney disease (Adv Dent Res, 1992; 6: 110–3).

Further proof of the highly toxic nature of mercury, said Levenson, are the meticulous recommendations by the American Council on Dental Materials and Devices concerning the storage and use of mercury.

This organisation recommends the use of tightly sealed containers, avoiding any contact with the mercury and performing annual mercury-level tests on all dental personnel.

Although we refer to our fillings as 'silver' or mercury, amalgam is in fact comprises about 52 per cent mercury, with the remainder being copper, tin, silver and zinc. Dentist Hal Huggins, Levenson's US counterpart, has a master's degree in immunology, and has set up a laboratory that performs numerous blood and immunological tests to identify patients who are mercury-sensitive. In his master's thesis, Huggins gathered a wealth of scientific documentation proving that all five elements found in amalgam affect all the major organs, including the kidneys, liver, heart, and central nervous and immune systems.

Although past studies have shown that dentists have high concentrations of body mercury and double the number of brain tumours (Br J Industr Med, 1991; 48: 729–34), new evidence demonstrates that amalgam causes subtle brain damage as well.

Several years ago, an assessment of neurological function in dentists in Singapore found that they performed less well than a similar group that hadn't had regular amalgam exposure, although they did just as well on intelligence tests. The higher the exposure to mercury, the worse the performance on the neurological tests (Br J Indust Med, 1992; 49: 782–90).

Dr Diana Echeverria, a neurotoxicologist at the University of Washington in the US, also tested American dentists to see whether they showed signs of mercury poisoning. Her study found subtle losses of manual dexterity and concentration—both evidence of central nervous system disorder.

The party lines of both the American Dental Association and British Dental Association are that the mercury in amalgam fillings becomes inert or 'locked in' when mixed with the other metals and placed in the mouth. But numerous researchers have proved not only that mercury vapours are continuously released from the fillings, but that it also corrodes in the mouth—that is, it rusts—as metallic ions and vapour form on the amalgam surface once it comes into contact with heat, saliva and elements such as fluoride or large gold fillings.

Although most of these products are excreted from the body, about 10 per cent of it accumulates in the various organs and tissues of the body, according to researchers at the University of Calgary. Furthermore, said Levenson, the five metals contained in amalgam can combine to produce some 16 different corrosion products, all floating around in the body to unknown effect.

In addition, numerous researchers have proved that mercury vapours are continuously released from the fillings, particularly when you chew or eat hot or acidic foods. There is solid proof that mercury released from the teeth is deposited in the body.

In one study conducted by the University of Calgary team, chewing increased the intraoral mercury content (that within the air of the mouth) sixfold among those test subjects with amalgam fillings and 54 times more than found in the control subjects. The greater the number of fillings, the more mercury vapour was released (J Dent Res, 1985; 64: 1072–5).

Professor R. Soremark of the Karolinska Institute in Sweden says: "The absorption rate is close to 90 per cent, 74 per cent of which is retained by the lungs. In 10 minutes, 30 per cent of the mercury absorbed in the lungs is transferred to the blood."

Professor J.V. Masi of the Western New England College in Springfield, Massachusetts, has studied this issue in detail and discovered that all of the metals used as restorative dental materials are capable of corroding.

Although much of the evidence about mercury involves an element of speculation, there is growing proof that the mercury released from fillings settles in tissues in the body.

Dr Murray J. Vimy, clinical associate professor of the Department of Medicine, and numerous other medical researchers from the Departments of Radiology, Medicine and Medical Physiology at the University of Calgary have spent more than a decade examining the effects of amalgam fillings on sheep, monkeys and, more recently, humans. Their published evidence conclusively proves that mercury from amalgam fillings migrates to various tissues in the body—specifically, in the oral cavity, lungs and gastrointestinal (GI) tract—causing a type of 'timed-released poisoning', as Vimy has called it.

Until recently, while we knew that mercury was released by chewing, we didn't know where it landed. In December 1989, Dr Vimy and his colleagues at the University of Calgary published a study in which radioactive amalgam fillings were placed into the teeth of adult sheep (FASEB J, 1989; 3: 2641–6).

Radioactively labelled mercury guaranteed that the mercury could be easily traced and located. It also eliminated the need for a control as mercury present from food, air or water wouldn't be so labelled; and sheep are thought to have physiological responses that are most like those of humans.

Within 29 days, substantial quantities of mercury appeared in the lungs, GI tract and jaw tissue. Once the mercury was absorbed, said the researchers, "high concentrations of dental amalgam Hg [the chemical symbol for mercury] rapidly localised in the liver and kidneys". The denser the mass of tissue, the more mercury collected there.

Furthermore, during the 29 days of the study, the intraoral mercury vapour measurements closely approximated those taken from people in previous studies. Other sites of substantial mercury placement were the brain, the heart and several of the endocrine glands.

In their paper, published in the *FASEB Journal*—the official publication of the Federation of American Societies for Experimental Biology representing some 30,000 scientists—the authors, all general medical scientists or biologists with no axes to grind on this issue, concluded:

"Our laboratory findings in this investigation are at variance with the anecdotal opinion of the medical profession, which claims that amalgam tooth fillings are safe. Experimental evidence in support of amalgam safety is at best tenuous. From our results, we conclude that dental amalgams can be a major source of chronic mercury exposure."

Although 12,000 papers have been published to date on the dangers of amalgam, it is only because of the interest of respected medical departments such as Dr Vimy's and their devastating findings that the issue is hotting up, particularly in North America.

Dr Vimy stresses that he is a scientist who sits squarely in the middle of the amalgam debate—between the left, which claims amalgam is responsible for every illness there is, and the right (the dental associations), which turns a blind eye to mounting scientific evidence.

"The evidence shows there is some risk; we're not sure of the extent of the risk, but it certainly is prudent to study and consider it," he says.

Although we at **WDDTY** do not support animal experimentation *per se*, much of the research being done on amalgam is being performed on animals. We present it without endorsement because it is among the most important scientific evidence of amalgam fillings to date, and Dr Vimy and his colleagues are among the most prestigious groups studying the issue.

Sheep were originally chosen for the Universary of Calgary's study because they are especially ruminant—that is, they chew all day. Dr Vimy's team felt that if mercury didn't go into the tissues and organs of sheep, it wouldn't go into the tissues or organs of any living creature: "Sheep," he sums up, "were a worst-case scenario."

Dr Vimy and his colleagues were criticised—ridiculed is more accurate—for using sheep because they have a higher frequency of chewing than humans as well as more than one stomach and, therefore, more bacteria for digestion.

Headlines in the medical press tended to disparage the findings, like one that said: 'Sheep Baaad Amalgam Recipients'.

So Dr Vimy's group decided to repeat its experiment in monkeys. They chose monkeys because their rate of chewing is similar to humans'—as are their teeth, their diet, feeding frequency, chewing pattern and organ

physiology. They found the same pattern of mercury deposition in the oral cavity, lungs and GI tract of monkeys as they had seen in sheep.

"If the information we have about the effect of amalgam fillings were presented before the Food and Drug Administration today, they would not pass it for use because it hasn't passed the animal tests," said Dr Vimy.

In 1990, Dr Vimy and his researchers conducted another sheep experiment, the results of which were published in the *American Journal of Physiology* (1990; 258: R938–45).

Because mercury tends to migrate primarily to organs like the kidneys, they wanted to find out its effects. After placing regular (rather than radioactive) fillings into the mouths of several sheep, Vimy's group measured the flow rate of inulin, a starch, through the sheep's kidneys. This is a standard index of kidney function since inulin is neither secreted nor absorbed.

"Basically, we found that 30 days after the placement of amalgam fillings, kidney function and its filtration capacity were reduced by 50 per cent," Dr Vimy said. "We had placed glass ionomer (white plastic) fillings into control animals, who showed no change in kidney function. We also found a rapid rise by 300 per cent of sodium in the urea, even though we had restricted the sodium diets of the animals. So that showed us that sodium was lost. And we found a rapid decline in albumin excretion—by 68 per cent," he said.

"What this means," Dr Vimy added, "is that the reabsorption of urea was impaired. The albumin levels meant that kidney blood flow was reduced." In other words, amalgam fillings may markedly reduce the efficiency of your kidneys. "It's like walking around with one kidney," he says.

Vimy's animal studies, which were met by ridicule within the dental community, have since been vindicated by the work of Professor H. Vasken Aposhian, head of the Molecular and Cellular Biology Department of the University of Arizona in Tucson.

Aposhian and his team graded the amalgam filling content of human volunteers, from which they were given an amalgam score. The study participants were then given a salt of 2,3-dimercaptopropane-1-

sulphonic acid (DMPS), a chelating agent which binds to mercury and removes it from the body through urine.

An analysis of the results showed a positive correlation between the amount of amalgam in the teeth and the amount of amalgam in the body. Aposhian's team was also able to show that two-thirds of the mercury excreted in the urine of those study participants with dental amalgam came from their fillings (FASEB J, 1992; 6: 2472–6; Clin Toxicol, 1992; 30: 505–28).

Mercury and electrical fields

Teeth can work like little batteries. Metal in the mouth produces electrical fields around certain teeth which can produce many bizarre effects. American holistic dentist Hal Huggins used to show slides of teeth that had been cut open to show the scorch marks they contained where electrical currents had been running for many years.

This effect is hardly surprising when you consider that, with every filling in your mouth, there are two or more metals and a saltwater fluid medium (saliva). This is exactly how Allessandro Volta's original batteries were made, and the battery in your current motorcar is essentially the same thing.

The trouble starts because of the fact that electrical currents leach the mercury out of the teeth through an effect called 'electrolysis', where damage is due to the passage of a galvanic (unidirectional) electrical current. This is why some patients complain of a constant metallic taste in the mouth, which is made worse by hot fluids and salty food (as these create more electrolysis). Most worrying, electrolysis is capable of releasing deadly mercury vapour, which goes straight to the brain tissue, where it is highly invasive and toxic.

Nevertheless, as potentially damaging as mercury in the mouth is the electricity itself. When testing teeth for electrical effects, momentary spikes of up to one volt can be seen—enough to light a small torch or flashlight. It's worth remembering that the currents generated by amalgam are formed very close to the brain, which ordinarily operates at far lower potentials (only a few millivolts). The brain lies only a few millimetres from the jaw bone, where the roots of the teeth are inserted, just

on the other side of the thin cranial bone and the meninges (the three membranes enveloping the brain and spinal cord). This kind of current can cause mental dysfunction, which is often found in clinical practice.

One patient, a 44-year-old woman with Meniere's disease, also suffered from vertigo and vomiting, with intermittent staggering (so-called 'sailor's gait'). She couldn't think clearly, and had trouble with her memory and eyesight. These mental problems, plus a constant pain in the nape of the neck, left her unable to work. But because her doctors could find no clinical explanation, she was told it was all in her head—which in a way was true. When a brain tumour was suspected, tests were required to exclude this grim possibility.

Eventually, a surgeon referred her to Dr Helmut Raue, an electroacupuncture specialist who understands biological dentistry. He measured her teeth for galvanic currents and found a 215-microampere current running between a gold filling and a nearby amalgam. A week after she had the amalgam removed, all her pain had disappeared, and her balance had returned to normal.

As patients usually don't consult their dentist when they experience symptoms such as headache, facial neuralgia, dizziness, sleep disorders and digestive disturbances, such cases don't often come to light.

Energy fields

Besides simple battery problems, electroacupuncture practitioners are finding teeth as transmitting foci to be a common cause of energetic disturbance. The problem is much more complicated than it might at first appear.

Several key acupuncture meridians cross the line of the teeth as they pass over the face. An abscess or 'transmitting focus' can create pathological effects anywhere along the meridian. As these meridians are connected to secondary organs and other sites, problems with a front incisor may have an impact on the kidneys, as the kidney meridian passes through the incisor teeth. The kidneys, in turn, are related to the knee joints. Patients who have incisor problems or a bridge at this location seem to invariably have arthritis in their knees.

The consequences of these interconnections are sometimes very

surprising indeed. In one case, a dentist had prepared a crown prosthesis, the type that uses a nickel post that fits in a hole drilled down the centre of the tooth to give it support. As the post was being inserted in the right upper jaw, the patient let out a squeal: she had gone blind in the right eye. When the dentist removed the crown, she could see again. When he then put it back on, she went blind again. This was repeated several times, after which she refused the crown and had the tooth removed.

What is important about this striking example of what we might call 'virtual dentistry' is how instantaneous the reaction was. For this reason, it could not have resulted from a chemical or even metal toxicity. Allergies to nickel are not uncommon but, clearly, it would take time to develop and become manifest. The sudden loss of the patient's vision indicated a clear neurological dysfunction along the optical pathways due to a field disturbance, probably at the quantum level.

This story makes vividly clear what risks we take when we allow metal into our mouths. The resulting disturbance to the body's energy field can have unpredictable and serious consequences. If this woman had not lost her vision immediately, but had gone blind over the subsequent few weeks, it is a near-certainty that the correct cause of her vision problems would never have been correctly diagnosed. She would very likely have ended up undergoing harmful and unnecessary interventions, all of which would have failed as they were not correcting the real problem.

Mercury and congestive heart failure

Groundbreaking research from Italy says that one major environmental cause could be dental amalgam fillings. Researchers at the Catholic University in Rome have tested patients with advanced congestive heart failure and found a 'marked elevation' of mercury in the heart tissue—in the order of a massive 22,000 times higher than normal.

None of these patients worked or lived in places that would have exposed them to mercury, so the source of this toxin in their bodies must have been the silver-mercury amalgam fillings in their mouths.

Interestingly, most of the mercury was concentrated in the heart, with

very little found elsewhere in the body. Quite why this happens is not known, but the researchers speculated that the mercury can "adversely affect . . . heart metabolism and worsen cellular function" (J Am Coll Cardiol, 1999; 33: 1578–83).

The Italian findings tie in with older American research that found that people with amalgam fillings had significantly more heart-related problems than those who had healthy teeth. Amalgam-filled patients also had more irregular heartbeats and fatigue—typical of congestive heart failure (Sci Total Environ, 1990; 99: 23–35).

Similarly, when Soviet doctors studied workers exposed to mercury, they found that the heavy metal had a profound effect on the heart, interfering with its normal contractions, electrical conductivity and overall regulation. Like the Italians, they, too, found that mercury accumulated in the heart tissue and valves (*Cardiotoxic Effects of Mercury*. DHEW (NIH) Publication No 74-473, 1974; 109–34, 199–210).

So, with mercury accumulating in the heart, could it be affecting levels of coenzyme Q10 (CoQ10), primarily found in the heart? Nobody knows for sure because the research hasn't been done, but such a mechanism seems plausible.

Mercury and lawsuits

Until recently, the American Dental Association (ADA) has limited its response to total denial of any danger. The ADA tried to discredit anti-amalgam dentists by labelling their efforts "fraudulent".

But on 20 September 1990, this changed dramatically—possibly forever—when a group of dentists, all ADA members, filed a class-action lawsuit against the ADA for 'breach of contract'.

When a dentist becomes a member of the ADA, the organisation effectively enters into a 'contract' with him. One contractural obligation is to provide scrupulously accurate, complete and pertinent information within the field of dentistry. This obligation is explicitly determined in the ADA's own *Principles of Ethics and Code of Professional Conduct*. The code declares that statements or information concerning the practice of dentistry shall not be "false or misleading" and must be avoided whenever any statement contains "material misrepresentation of fact" or omits "a

fact necessary to make the statement as a whole not materially misleading".

The class action alleged that the ADA had failed to provide accurate and truthful information pertaining to mercury amalgam fillings, and that it had instead provided misinformation while knowing that it was inaccurate, false or materially misleading and incomplete.

The case has been adjourned *sine die*—in other words, indefinitely—although the ADA has informally agreed to fund research into the dangers of amalgam fillings.

Even if the dental associations in Britain and America have chosen to ignore the mounting data suggesting serious potential problems from amalgam, companies which manufacture amalgam (and could be most open to liability claims) recently had to take the warning signs seriously.

Under California law, Proposition 65 aims to protect people from being unwittingly exposed to chemicals known to cause cancer or birth defects. Any work environment containing materials with such potential must carry a warning.

The Environmental Law Foundation (ELF) decided to test this law by taking one of the biggest manufacturers of dental amalgam to court on this issue. The court ruled in favour of the Foundation, and Connecticut-based Jeneric / Pentron Inc became the first company to issue health warnings on its product in the form of an alert to dentists, dental staff and patients in California about the potential dangers of birth defects from exposure to mercury.

Jeneric / Pentron Inc also agreed to stop selling silver–mercury fillings to dentists who fail to make a full disclosure of the health warnings to their staff and patients.

However, 10 other dental-amalgam manufacturers subsequently banded together and challenged the ruling. A federal court judgement overturned the earlier one on the grounds that the regulatory authority for amalgam was not Proposition 65, but the US Food and Drug Administration—which, of course, has ruled that mercury fillings are safe.

"For every one step forward," says Dr Vimy, "we take 10 steps back."

In the summer of 1996, the lower court's ruling was overturned on appeal by the ELF; the appeal court ruled that the lower court had erred

in granting the reversal. Since Proposition 65 is a law passed by California voters, FDA regulation does not preclude the Proposition's mandate of a warning to patients. So, California dentists must disclose to their patients that fillings contain mercury.

Mercury in Europe

The US and UK governments' positions are proving to be at variance with the decision of several other countries.

In Germany, the Federal Health Agency (Bundesgesundheitsamt; BGA) in Berlin decided in early 1992 that amalgam fillings could be used only for molars. The BGA also announced that amalgam containing gamma-2, a compound of tin and mercury, would be banned because of its inherent instability and the risk of mercury being released while a tooth is being filled.

The German government has been cagey over this issue, denying that there is scientific evidence that amalgam can cause long-term disease other than for people who are allergic or have electrochemical reactions. Nevertheless, they also say that amalgam shouldn't be used in pregnant women, patients with kidney failure and toddlers (Lancet, 1992; 339: 419).

The German Federal Registry of Dentists has also sent a letter to the Minister of Health requesting that he rule that no dentist in Germany be allowed to use dental amalgam (Bio-Probe Newsletter, May 3, 1994).

The Swedes took the first step by establishing an outright ban of amalgam fillings by 1997. Austria and Germany have subsequently followed suit. Furthermore, they ban the use of mercury in pregnant women, unlike the UK's health system, which encourages women to have dental work done during their pregnancy.

Some German companies such as Degussa, one of the world's largest manufacturers of dental amalgam, is stopping the production of amalgam even though it represents about half of its turnover, and is moving into the manufacture of composite fillings, the plastic alternative to amalgam.

4
Effects of Mercury

So now that we know that mercury from amalgam fillings goes down into the body and settles in tissues, what exactly does that mean?

There is no conclusive published evidence showing that amalgam fillings produce certain diseases, particularly since mercury poisoning has a lot to do with genetic predisposition, length of time in the body and other environmental factors. However, certain studies and clinical observations imply a relationship between amalgam and the onset of some diseases.

Experts vary widely in their estimates of the number of people affected by dental fillings. Professor R. Soremark of the Department of Prosthetic Dentistry at the Karolinska Institute in Sweden estimates that about 7 per cent of people will react to their amalgam fillings; other studies put that figure closer to 25 per cent.

In a consolidated report of six separate studies of patients who had their amalgam fillings replaced, nearly all of the 1600 participants reported cure or improvement of 31 types of conditions.

The studies from four countries showed that an aggregate of 89 per cent of those who said they suffered from allergies reported an improvement. As for GI symptoms, patients reported improvement or cure of bloating (88 per cent), general GI problems (83 per cent) and urinary tract problems (76 per cent).

Of those with headaches, 87 per cent cured or improved their migraines. Significantly, three-quarters of those with multiple sclerosis said they were better or cured.

If these data were to be extrapolated to all of the people in the US who have silver fillings, 17.4 million would have their allergies improve or disappear simply by having their mercury dental fillings exchanged for non-mercury ones (Bio-Probe Newsletter, March 1993).

Mercury and myalgic encephalomyelitis (ME)

Hal Huggins says that over 90 per cent of his 2000 patients have ME-like symptoms of fatigue that improve when fillings are removed.

Biologically, says Huggins, this is easily explained. Mercury interferes with the oxygen-carrying capability of red blood cells; in most of his patients, who are given an 'oxyhaemoglobin' test, the oxygen transport ability of the red blood cells is about half what it should be. This explains the chronic tiredness in the presence of normal haemoglobin levels.

Effects on the fetus

In 1989, the University of Calgary Medical School published evidence that, within three days of placing amalgam fillings in pregnant sheep, mercury showed up in the blood, pituitary glands, liver, kidney and placentae of their babies.

By 33 days (around the time of birth), most fetal tissue had higher levels of mercury than in the mothers. During nursing, the mother sheep were found to have eight times as much mercury in their milk as in their blood (Am J Physiol, 1990; 258: R939–45).

More recently, Professor Gustav Drasch, a forensic toxicologist, and his colleagues at the Institut für Rechtsmedizin in Munich examined the brain, liver and kidney of dead human babies and fetuses aborted for medical reasons. They found that tissue mercury levels correlated significantly with the number of amalgam fillings in their mothers.

Furthermore, children accumulated mercury in their kidneys apparently from their mother's amalgams to a similar extent as adults do from their own fillings. As most of the children weren't breastfed, or were breastfed for only a short period, the researchers concluded that the mercury must have crossed the placenta (Eur J Pediatr, 1994; 153: 607–10).

Mercury and hormone levels

There is also evidence that silver fillings may affect fertility. A group of German researchers gave women with hormonal irregularities the chelating agent DMPS to remove mercury from the body while also examining their blood for evidence of excessive levels of various pesticides. By far, the most common problem was mercury contamination,

which again correlated significantly with the woman's number of fillings and the release of mercury while chewing. Women with hormonal disorders excreted the most mercury after being given DMPS (Z Gynäkol, 1992; 14: 593–602).

In another study conducted by some of the same German researchers in Heidelberg, of 132 women suffering from unexplained hair loss where other therapies had been unsuccessful, 49 per cent showed evidence (on DMPS testing) of elevated mercury levels and, in 68 per cent, the condition disappeared once they'd had their fillings removed (Klin Labor, 1992; 38: 469–76).

Lowered T-cell numbers

Mercury from amalgam fillings appears to lower the number of T lymphocytes, one of the most important components of our immune system.

Broadly speaking, the immune system comprises T-lymphocyte cells and B cells. Of the numerous kinds of T cells, the most important are the T4 lymphocytes—also called 'helper' cells—whose job it is to identify foreign bodies and cancer cells for the B cells to engulf and destroy.

Without these helpers, the B cells cannot do their job. Hence, in AIDS, although B cells are available to attack the offending viruses, there aren't enough T cells around to label them the enemy.

On the other hand, T8 lymphocytes—also called 'suppressor cells'—prevent B cells from attacking normal body tissue. Any lowering of the total T-cell population or disturbance in the delicate T4 : T8 ratio can lead to autoimmune disorders such as multiple sclerosis, lupus erythematosus (a chronic inflammatory disease) and inflammatory bowel disease.

In a 'preliminary report' published in *The Journal of Prosthetic Dentistry* (1984; 51: 617–23), David Eggleston, an American dentist who has also studied the effects of mercury exposure, measured the T lymphocytes in three patients before and after removing their amalgam fillings.

In all three cases, the proportion of T lymphocytes went up substantially (from 47 per cent up to 73 per cent in one case, an increase of 55.3 per cent).

Dr Eggleston then reinserted amalgam in the dental cavities of two

of the patients and measured the percentage of T cells. In both cases, the proportion of T lymphocytes decreased again (in the patient already mentioned, down to 55 per cent—a decrease of 24.7 per cent).

Finally, when he removed the new amalgams and replaced them with non-amalgam fillings, the T cell counts went up again in all patients—by 72 per cent in the one instance, an increase of 30 per cent.

Eggleston reported on 30 such trials at a recent conference, all of which showed an average improvement in T cells of 30 per cent.

Hal Huggins claims that number is conservative: "At the University of Colorado, I've measured T-cell rises of 100–300 per cent after fillings were removed," he says.

These findings could mean that amalgam has a role to play in causing allergies, autoimmune diseases and even leukaemia.

In the *International Journal of Biosocial and Medical Research*, Huggins published a paper showing that white blood cell abnormalities, such as those found in leukaemia, tend to normalise when fillings are removed in the correct electrical sequence.

Mercury and the immune system

Hal Huggins and the late Jack Levenson claim there is a wealth of clinical observations showing that mercury fillings can contribute to allergies, candidiasis and other problems of the immune system.

Huggins says that his tests show that mercury upsets protein metabolism and the normal gut flora. This can result in food particles remaining undigested, which can lead to allergies and to the overgrowth of opportunistic yeasts such as *Candida albicans*.

Both Huggins and Levenson have themselves reported many cases where patients who were suffering from food or environmental ailments improved in some way once their fillings were removed.

In one of Levenson's patients—a middle-aged woman with numerous allergies—she was able to tolerate food better and her bowel problems were eliminated. In another case, a patient's chronic conjunctivitis cleared up with removal of her amalgam fillings.

One Swedish patient had suffered with allergic problems, including eczema, from birth. At age three, the girl had her first amalgam filling;

she was ultimately to have seven fillings over 11 surfaces. At five, she developed severe asthma and had to take daily medication. During the whole of her adolescence, she was often hospitalised. She also suffered from severe headaches and double vision.

On examining her history, researchers discovered that her asthma had come on following the placement of two deep fillings. They also noted that her mother had received a large amalgam filling during pregnancy.

The girl and her mother consented to have all their amalgam fillings removed.

Six weeks after the procedure was completed, the girl's eczema began to disappear, and she no longer required asthma medication. Seven months later, both conditions completely had cleared up and stayed clear for the eight years she was followed-up (Int J Risk Safety Med, 1994; 4: 229–36).

Even though there are many such success stories, Levenson and Huggins caution that, unlike their multiple sclerosis patients, 85 per cent of whom improve, only 60 per cent of their 'environmentally ill' patients get better, suggesting that mercury is only one of many contributory factors.

Mercury and *Candida albicans*

The University of Georgia found increased mercury-resistant bacteria in the gums and intestinal bacterial flora of monkeys after the placement of dental fillings. In the past, Dr Anne Summers has shown that, when there is high mercury resistance in the bacteria in the gut, there is also a high resistance to multiple antibiotics.

To greatly simplify what happens, the presence of mercury can be said to create a change in the chemical makeup of the two-and-a-half pounds of 'friendly' bacteria living in the intestine, making them resistant to antibiotics. This means that these bacteria, which are essential for the smooth operation of the immune system, are, in Jack Levenson's words, "otherwise engaged" and no longer able to keep fungi such as *Candida albicans* in check.

Reabsorption of mercury vapour is also enhanced, says the Univer-sity of Calgary's Dr Vimy, as it migrates from the teeth. This sets up a basic dysfunction in the gut which, according to Levenson, could be responsi-

ble for candidiasis and the proliferation of allergies that suddenly develop in people in their middle years.

Mercury and Alzheimer's disease

The most damning research into Alzheimer's disease (AD) points a finger at mercury.

A medical research team at the University of Kentucky in Lexington, which has been investigating the possible link between mercury and AD, found high levels of the element in the brain tissue of AD victims (Neurotoxicology, 1986; 7: 197–206; Biol Trace Element Res, 1987; 13: 19–23). Dr William Markesbery and his team found that the highest trace element in the brain of 10 autopsied AD patients was mercury (Brain Res, 1990; 533: 125–31).

"The present study suggests that the elevation of mercury in AD is the most important of the imbalances we have observed," the researchers concluded. "These results suggest that certain complex forms of mercury must be considered as a potential source of the aetiology of AD."

The Markesbery study noted that whether mercury was a possible cause of AD, or simply a deposit on a degenerating brain, remained to be determined. They concluded: "This and our previous studies suggest that mercury toxicity could play a role in neuronal degeneration in AD."

The link between mercury and AD was strengthened by Dr Boyd Haley and colleagues, who found that mercury-fed rats developed a diminished tubulin level similar to people with AD. Tubulin is a protein needed for the healthy formation of nerve tissue in the brain, and a lack of tubulin results in messengers in the brain not connecting properly. When fed aluminium, usually thought to be a major cause of AD, the rats displayed no change in tubulin levels (Federation of American Societies for Experimental Biology, 75th Annual Meeting, 21–25 April 1991).

Markesbery and his team also found diminished levels of zinc and selenium in the 10 AD-affected brains they examined. This is significant as zinc and selenium are both known to have a protective role against heavy-metal poisoning in body tissues.

Indeed, aluminium may well be a 'red herring' in the quest to find the cause of AD. It could be, as some suggest, that a brain depleted of zinc and overwhelmed by mercury is susceptible to the deposition of

aluminium, but that the particular heavy metal in itself doesn't cause the problem.

Or it could be that both aluminium and mercury contribute to the condition.

The Markesbery team noted that: "The source of brain mercury in AD is not known, although dental amalgams and environmental sources such as seafood are potential sources".

However, even the World Health Organization concedes that the general public's highest daily exposure to mercury comes from dental amalgam fillings.

Pat, now 80 years old, had a mouth filled with 15 large amalgam fillings, some covering virtually the entire tooth. Periodically, his dentist of 35 years would replace an old silver filling with a new one. In 1995, his wife Melitta noticed that his motor skills began deteriorating. By the summer of 2000, his walking had become "quite poor"; when he fell at a luncheon party, she was astonished to realise that he didn't remember how to get up and that he refused to cooperate with friends attempting to help him. Later that summer, Melitta also noticed that a 'fog' seemed to have descended over Pat's mind. "Mentally, he just wasn't with it at all." He couldn't walk or climb stairs without assistance. During their holiday in Austria, he seemed to have forgotten how to swim—formerly a favourite activity.

In September 2000, Melitta took him to see a geriatrician, who diagnosed Alzheimer's and predicted that Pat would need to be placed in a home in three months' time. The shock of this diagnosis jolted Pat into listening to his wife, who'd been trying to get him tested for amalgam poisoning for years. Tests demonstrated an extraordinarily high electrical current in his mouth coming from the fillings, which persuaded Pat to have the fillings taken out.

Pat had the fillings removed in two sessions by a mercury-free dentist who carefully observed the precautionary protocol. On his way to the dentist's surgery, Pat needed to hang onto Melitta to climb the several flights of stairs to the surgery; immediately after the final session, he walked down the stairs unaided. Soon after the fillings were removed, his GP agreed with Melitta that Pat had 'woken up'.

After five months of a detox programme to get all of the amalgam out of his system, Pat now goes out again by himself. He has prepared the couple's tax returns and writes letters. Although his walking may occasionally be poor, it is getting better and, more important, Pat now recognises and corrects himself when he isn't walking properly.

The latest research published by Vimy and his team at the University of Calgary Medical School used rats to show that inorganic mercury compounds markedly inhibited tubulin levels, the protein needed for the healthy formation of neurofibrils, or connective nerve tissue.

Most significantly, the concentrations of mercury in the brain of rats were similar to those recorded in monkeys 28 days after placement of dental amalgam fillings (J Neurochem, 1994; 62: 2049–52).

Mercury and multiple sclerosis

Mercury has been associated with autoimmune diseases in a number of studies. Scientists at the Institute of Dental Research in Prague looked at the response of autoimmune patients who were allergic to mercury when their amalgam fillings were replaced with white ones.

Measurements of lymphocyte activity six months after removal showed substantial improvement, especially in the patients with multiple sclerosis (MS). The researchers concluded that the mercury in amalgam is a risk factor for patients with autoimmune diseases (Neuro Endocrinol Lett, 2004; 25: 211–8).

Dr Patrick Kingsley and Hal Huggins, both of whom have treated hundreds of MS patients, almost always find evidence of mercury toxicity in these cases.

The connection was also borne out by a study at the Rocky Mountain Research Institute, where MS patients with amalgam fillings were found to have not only significantly lower levels of T lymphocytes, blood cells, haemoglobin and hematocrit than MS sufferers without amalgams, but also higher detectable levels of mercury in the hair and blood (Sci Total Environ, 1994; 142: 191–205).

The link is not only apparent on the physical level: there is also evidence from an earlier study by the same research team of a significantly higher rate of psychological disturbances among MS sufferers with amal-

gam fillings compared with those who had had them removed (Psychol Rep, 1992; 70: 1139–51).

Amyotrophic lateral sclerosis and mercury

Connections are also now being made with other sclerosing diseases such as amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's disease, the wasting disease that afflicts cosmologist Dr Stephen Hawking.

A Swedish journal documented the case of a patient with numerous neurological problems diagnosed in 1984 with ALS. A dentist who recognised many symptoms as being similar to those of mercury poisoning suggested that the patient have her copious amalgam fillings replaced, particularly as she could date her neurological problems from the time the fillings were put in.

Six weeks after the fillings were replaced, the patient was able to walk upstairs without experiencing back pain. Four months later, she returned to the same university hospital in Umea, Sweden, which had diagnosed her illness, for a week-long follow-up investigation.

The following notation was placed in her record: "The neurological status is completely without comment. Hence the patient does not show any motor neuron disease of type ALS. She has been informed that she is, in neurological respect, fully healthy."

The hospital concluded that the problem had been due to mercury in the spinal cord. The patient is currently still in good health (Int J Risk Safety Med, 1994; 4: 229–36).

5
Removing Your Fillings

Should you have your fillings removed? Not necessarily. Both the late Jack Levenson and Hal Huggins suggest that patients with suspected mercury poisoning should first undergo a series of tests to demonstrate mercury sensitivity.

A test for mercury poisoning

At The Chelsea & Westminster Hospital in London, Drs Don Henderson and Michele Monteil of the Department of Immunology, together with Dr Levenson, developed a simple blood test to determine whether or not your fillings are making you ill.

The test, called the metal-specific memory T-cell test (MSMT), determines your immune system's 'memory' of dental and other metals. When your body is exposed to a foreign invader (say, a virus), your body mounts an immune defence to kill the virus and stop the invasion. The next time you're exposed to the virus, your body attacks it more quickly and powerfully because of the antibodies it has developed. This immune 'memory' responses can actually be measured.

As for metal, although everyone demonstrates an immunological memory of a variety of metals, including mercury, only those who have had a strong reaction—for instance, those who get a rash from nickel—will show a strong memory response.

A test like this to measure industrial exposure to heavy metals has been available for years. Drs Henderson and Monteil demonstrated that the strength of the immune-system response to mercury and other dental metals can also be graded.

The test has two parts, measuring first amalgam and nickel, and then chromium, cobalt, palladium, gold and platinum.

For more information on the MSMT, ring the British Society for Mercury-Free Dentistry (tel: 01242 226 918).

Other tests for mercury

DMSA (meso-2,3-dimercaptosuccinic acid) screening test

This test, while not as sensitive as the blood test, will give some idea of how much mercury is floating around your body. DMSA chelates (binds to) mercury and excretes it, and may be taken irrespective of meal times.

Before the test

- Do not eat fish for two days
- Avoid any contact with mercury (e.g. dental surgeries, contact-lens sterilising solutions, ointments and cosmetics)
- Look out for labels listing thimerosol, methiolate and any mention of 'mercuric' or 'mercurous'
- Do not take during pregnancy.

During the test

- Collect a sample of midstream urine in container
- Take three DMSA capsules together at the same time
- Three hours later, collect a sample of midstream urine in container
- Drink at least three pints of filtered water over the next 24 hours.

Sulphur

Take approximately one-tenth (1/10) of a teaspoon of sulphur three times a day, sprinkled on a mouthful of food, on any day that DMSA is taken and continue for one extra day.

The chewing gum test

WDDTY columnist Dr Harald Gaier has adapted a simple test developed by Max Dauderer, in Munich, which your dentist can use to see if you are 'leaking' excessive amounts of mercury. All you need is a stick of sugarless chewing gum and some zinc-free wads of cotton.

Make sure before you start the test that you haven't chewed anything for at least two hours. Then, take one small wad of cotton and place it in your mouth for a short while until it has become soaked with your saliva. Don't chew the cotton.

Take the plunger out of a syringe and insert the saliva-sodden cotton wad into it. Replace the plunger and squeeze the saliva into a sterile container marked 'before'. Close the container tightly.

Now, chew the stick of sugarless gum intensively (concentrating on those areas of your teeth covered with amalgam fillings). Discard the gum. Collect a second saliva sample, using the same technique as before, but with another wad of cotton and another syringe. Squeeze the saliva out into a second sterile plastic container marked 'after'. Close this container very tightly.

Send both samples to a laboratory that can analyse each sample for the mercury content.

In Dr Gaier's experience, people with large amounts of amalgam have a far higher mercury content in the 'after' sample. For instance, in 40 of his patients investigated for amalgam poisoning, the amount of mercury in their saliva went up by an average of 415 per cent after chewing the gum. Those patients with symptoms suggestive of mercury poisoning—such as multiple sclerosis—invariably had high post-chewing mercury scores, often as much as 1800 per cent.

Your dentist's procedure

According to the experts, you should also be assessed for potential mercury toxicity on the basis of a comprehensive clinical medical and dental history. In addition, each individual filling should be tested for electrical potential with a millivoltmeter since each filling is a potential battery. Some clinical ecologists will perform this assessment.

The millivoltmeter tests the electrical potential of each individual filling (a variety of metals in the mouth mixed with saliva creates a 'battery' which sets up an electric current). Readings will indicate the extent of mercury vapour released and the potential systemic effects of the electricity.

When investigations indicate you have mercury toxicity:

- *Your dentist should check alternative dental materials to make sure you are not allergic to them.*
- *A pretreatment dental plan should be instituted*. This includes oral nutritional chelation therapy, dietary advice and vitamin supple-

mentation, and other detox procedures to help flush mercury from the body. This pretreatment routine will vary depending on symptoms.

- *If you have gone to a clinical ecologist, his report should be given to you to pass on to your dentist, with guidelines on how to protect you from mercury vapour during treatment procedures* and the precise sequence in which fillings should be removed. It's essential that the fillings be removed in the correct sequence or you could become even more ill than before.
- *Removing fillings is only half the battle*. Mercury must also be separated from your body's tissues and organs, and eliminated. This is a vital part of the treatment and it is often neglected.

If fillings are removed without these precautions, your health could deteriorate.

Supplements during treatment

A number of dentists and clinical ecologists recommend that you follow a supplement and chelation programme while you're having your fillings removed. This will combine with the metal and help the body excrete stored mercury. This therapy also replaces essential nutrients, which may be inactivated by low-level chronic exposure to mercury.

- *A good multivitamin/mineral supplement combination.* A combination of a good-quality vitamin / mineral supplement such as Multiguard, plus 200 mcg of selenium and Colon Care Plus for extra fibre taken for around three months, is recommended for amalgam detox. These are available by mail-order from Lamberts Healthcare, Lamberts Road, Tunbridge Wells, Kent TN2 3BE. Call them to order (tel: 01892 552 121) or to find the nearest distributor to you.
- *Vitamin C powder.* Start right away. Dosage: 1/4 teaspoon (1 g) once a day. On treatment days: 1/4 teaspoon before and 1/4 teaspoon after treatment.
- *Homeopathic treatment for dental amalgam.* Two drops of *Merc Sol* once a day, either under the tongue or in a little water, away from food by an hour either side. Start seven days before treatment and include the day of treatment.

- *Charcoal.* Take three charcoal tablets half an hour before any dental treatment involving amalgam removal.
- *DMSA.* Take two capsules within two hours of treatment; drink one pint of water over the next two hours.
- *Glutathione peroxidase.* This enzyme helps to eliminate mercury (but should not be taken concurrently with DMSA or DMPS). Dose: with water one half-hour before breakfast. Start two days before the day of the amalgam removal, and continue for two days after treatment (five days in all).

Removing fillings

According to Levenson and Huggins, the most important aspect of removing fillings is removing them in the right sequence—taking out the most negatively charged ones first.

Allergist Keith Scott-Mumby, who periodically holds clinics in Sweden, says that many of the patients rushing to have their amalgam fillings replaced are becoming more ill because the proper protocol is not being observed to protect them from the onslaught of the mercury vapours released during the procedure.

This happened to BioCare scientist John Stirling of Birmingham, who almost died after having his fillings carelessly removed.

The next most important point is to make sure you are receiving certain nutrients which will help to detoxify the body against the hazards of the substances. Here is the protocol that Huggins and Levenson recommend your dentist follow:

- The quadrant containing the highest negative current, as indicated by a millivoltmeter test, should be removed first, followed by the next highest negative current, and so on.
- Where possible, a rubber dam should be used in conjunction with efficient high-volume evacuation and high-speed cutting, using a water-coolant spray to protect you from the aerosol.
- If you have proved to be extremely hypersensitive to mercury, you could react during treatment. If there are any signs of an adverse reaction, your dentist should give 6 g of sodium ascorbate (vitamin C), not calcium ascorbate, in a glass of water.

- Negative current excites nerves. When fillings are removed from teeth with high negative currents, the tooth may become hypersensitive. This may be avoided by having your dentist insert a temporary dressing for about two months.
- If your dentist plans to use gold, he should remove all amalgam fillings first.
- If you are very sensitive: when drilling out amalgam, your dentist should cover your eyes with damp cottonwool or use wraparound goggles. He should also use a nosepiece for oxygen flow with tubing attached that extends out of operating areas.
- Make sure you start your oral nutritional chelation therapy *before* treatment. Mercury poisoning, and electrical currents and their associated electromagnetic fields may have blocked the availability of nutrients and confused the regulatory systems of your body. A sound nutrient base must be reestablished to help rebuild damaged tissue and support the immune system.

  The most important minerals include: free-radical scavengers such as the antioxidant vitamins A, C and E; copper, zinc and manganese, which help to clear mercury from the body; selenium, which combines with mercury to form sodium selenite prior to gradual elimination; alginate and pectin, which help to absorb heavy metals; and zinc, to counter high levels of lead, mercury and cadmium.

After your fillings are out

Once your fillings have been removed, it is vital that you get rid of the mercury from your body.

Methods to accomplish this include the use of DMSA, glutathione peroxidase, glutathione complex, reduced glutathione, glutamine, vitamin B_{12} and folic acid, and various vitamins / minerals.

Any remaining candidiasis, food allergies and digestive disorders should be treated after removal of amalgams as, then, they are usually more amenable to treatment.

Recent information confirms that mercury is excreted predominantly in the faeces. If you don't feel better after your fillings have been removed, it may be because you have retained hardened faecal matter

that contains trapped particles of mercury / amalgam and other heavy metals.

If you are constipated, you can treat it with a high-fibre diet or food-combining techniques and possible colonic irrigation.

If constipation is a chronic problem, you should have it sorted out before your fillings are removed.

Detoxing yourself: a reader's story

Sophie Bradshaw wrote to tell us at **WDDTY** of the careless removal of seven amalgam fillings by her dentist, who did not take any protective steps during the procedure.

"I started to feel really ill and got progressively worse until I found myself in hospital with agonising stomach pains. I was given morphine and thought I was dying. My legs were numb and tingly, I had muscle spasms and tremors and lost over a stone-and-a-half. After a month and various procedures (laparoscopy, endoscopy, colonoscopy, a barium meal, scans and blood tests), I was discharged as a 'medical mystery'.

"Once home, I spent two months in pain—unable to sleep or move and barely getting better.

"In desperation, I visited a homeopath, who suspected mercury poisoning after a two-hour consultation. Tests from Biolab confirmed this and I was referred to a London-based toxicologist, who started me on a course of detox.

"I am now beginning to lead a normal life, although I know that my body is still not totally rid of the poisonous substance.

"I would like to sue the British Dental Association. It's about time something was done about lax dentists, as no one should have to go through what I went through—absolute hell!

"I also recommend that anyone who embarks on a detox programme should do so slowly as the mobilisation of mercury can make you feel very ill. I took Biomer (Pharmaguard), which is basically MSM (250 mg), magnesium succinate (250 mg) and *N*-acetyl cysteine (100 mg), three times a day—but not every day."

A healthy diet, plenty of water and gentle exercise are all good, although it is better to avoid overheating. As mercury can disturb the

usual gut bacteria, probiotics may help, depending on symptoms. To escort the mercury from the body, charcoal tablets and *Chlorella* algae may also be useful. Finally, you'll need a lot of patience.

Amalgam alternatives

Potential health problems with alternatives to amalgam certainly can arise, but are fortunately rare in most people. Nevertheless, it's doubtful that any holistic dentist would describe *any* dental material as being *completely* without potential risk.

The alternatives to amalgam include the following:

- *Composites.* These form the basis of the white tooth-like substance used as the main element of the filling. They are either applied as a paste to the tooth and hardened in the dental chair with ultraviolet light, or made in a laboratory as a hardened inlay to match the cavity in the tooth
- *Glass ionomers.* These replace the layers of amalgam in the deeper recesses of the tooth cavity, and are always covered by composite. The glass ionomer itself rarely seems to cause problems, but all brands now appear to have fluoride added.
- *Lining materials.* These are used to protect the tooth under a deep filling. Someone having amalgam replaced with composites may need to have these lining materials placed beneath the composites. Although no studies have established that these linings—usually based on calcium hydroxide—cause problems, there have been anecdotal reports of allergic reactions, generally among those who are highly sensitive. These problems were resolved once the lining was changed.
- *Crowns.* Nowadays, crowns can be made entirely of dental porcelain, and none of the dentists we consulted has ever heard of allergic problems associated with this material.

The latest controversy surrounding fillings has to do with the potential of most composites, which are made of the petrochemical bis-phenol, to give off oestrogen-like substances.

In theory, these substances could cause a reduction in male fertility and possibly upset a woman's menstrual cycle.

However, these arguments remain theoretical as, to date, no research has been carried out on these composites. Mats Hanson, head of the Swedish Mercury Dental Patients' Association, estimates that the amount of oestrogen released in the entire lifetime of a composite filling would be the equivalent of what you might get from opening a tin can. Nevertheless, we will be watching for research with interest, and caution parents to avoid exposing their children to composites unnecessarily—as with fissure sealing (see page 60).

We do know that composites can make teeth sensitive when first placed. Jack Levenson recommended that, if you have a previous history of sensitivity in one or more teeth, or the tooth in question has a high electrical reading, you should ask your dentist to put in a temporary filling for two months, and only place the final composite when it has settled down and doesn't bother you anymore.

For further information on the removal of mercury fillings or testing: ring (01242 226 918) or Hal Huggins (001 719 548 1600; he will perform tests transatlantically).

Books you might like to read for further information are:

- *Dental Mercury Detox* (Bio-Probe Inc, 1997) by Sam Ziff, Michael F. Ziff, DS and Mats Hanson, PhD, which includes the Malmström high-fibre detox protocol.
- *It's All in Your Head* (Avery Publishing, 1993) by Hal A. Huggins, DDS MS.

6
Other Dental Practices

There probably aren't many people around who haven't at some point had a dental injection.

Dental anaesthesia

Although reactions to dental anaesthesia aren't very common, they do occur, particularly among people who have certain conditions.

For example, after taking Lignospan special (which contains hydrochloride and adrenaline), the 26-year-old daughter of one **WDDTY** reader suffered severe adverse reactions. She was so weakened by it that the dentist had to help her out of the chair and into a taxi. It took her 11 days to learn how to walk properly again. On a couple of subsequent occasions, the reaction lasted 'only' 24–48 hours before she regained normal strength in her legs.

This anaesthetic, which is similar to many commonly used by dentists, mainly consists of lignocaine. Adrenaline is one of a number of vasoconstrictors (blood vessel constrictors) added so that the anaesthetic isn't quickly transported away by dilated blood vessels.

Serious side-effects, as seen with our reader's daughter, tend to be systemic and, most commonly, affect the central nervous or cardiovascular system. Symptoms include dizziness, drowsiness, blurred or double vision, numbness, convulsions, unconsciousness and respiratory problems.

In fact, there may be little warning before a patient becomes unconscious and suffers respiratory arrest. The manufacturers warn that drowsiness is usually an early sign that the patient has rapidly absorbed the drug. Other worrying side-effects include a sudden drop in blood pressure, a rapid heart beat and even a heart attack.

According to the late Jack Levenson, few dentists are particularly knowledgeable concerning the potential dangers of anaesthetics.

At a recent conference of the British Homeopathic Dental Association, virtually none of the dentists in the audience was aware of those groups of people who should not be given injections (debilitated elderly patients and patients who are ill) or that children should be given reduced dosages according to their age and physical condition.

It's also vital that patients with vascular disease of the limbs or other cardiovascular problems be monitored after each injection.

A word about dental anaesthetics

The products now used by most dentists (lidocaine, prilocaine, procaine) are all compounds containing aniline, an aromatic hydrocarbon used to manufacture rubber and varnishes, photographic chemicals and other pharmaceuticals. Other members of this family include benzene, phenols, hydroquinone and naphthalene. These substances, also used in household products and pesticides, are known to accumulate and damage the bone marrow, causing depressed immune function (Townsend Lett Docs, April 1998).

American researcher Dr Alfred Nickel, who has studied these substances in depth, says that aniline compounds are well documented to be human poisons, classic carcinogens and neurotoxins. Although bladder cancer developing among aniline dye workers was described in the medical literature as long ago as 1895 by a German doctor, the use of Novocain (procaine), which was developed in 1905, soon became widespread.

The dental profession has always maintained that, once aniline is incorporated into a local anaesthesia, it is rendered benign and that the anaesthetic molecules are excreted by the body.

According to Nickel, this assumption was based on pharmaceutical company assurances which, in turn, were derived from a single study showing that 10 per cent of injected local anaesthetic was recoverable from urine. Exactly where the other 90 per cent of anaesthetic ended up was never actually explored (Covine BG, Vassallo HG, *Local Anesthetics: Mechanisms of Action and Clinical Use*, Grune & Stratton: 1976).

Injecting aniline as an anaesthetic is undoubtedly the most efficient way of infiltrating the body with this poison because it then enters

directly into the bloodstream, bypassing gastrointestinal barriers as well as the liver.

According to Nickel, exposure to aniline through dental anaesthetics far exceeds the maximum daily occupational exposure recommended by the Occupational Safety and Health Agency (OSHA) and the International Agency for Research on Cancer. These agencies suggest 10 mg per cubic metre of aniline for long-term exposure and 20 mg per cubic metre for short-term exposure.

According to Nickel, just 1 cc of 2 per cent lidocaine (the usual strength used in dental anaesthesia) will produce 10 mg of 2,6-dimethylaniline. A dentist might inject 14 cc of 2 per cent lidocaine while extracting wisdom teeth and 5–8 cc of lidocaine when doing caps or fillings. This may go on for as long as six months for a full-mouth reconstruction. This means that a patient gets a whopping 140 mg of 2,6-dimethylaniline every time a tooth is taken out, or 50–80 mg of it for other routine work.

Compared with tobacco, which also contains aniline, a single cigarette contains 102 nanograms of 2,6-dimethylaniline. According to Dr Nickel, you would have to smoke 20 unfiltered cigarettes every day for 12.9 years to inhale the same amount of 2,6-dimethylaniline that you get in a single cubic centimetre of 2 per cent lidocaine.

According to researcher Susan Stockton, writing in the *Townsend Letter For Doctors and Patients* (June 1998), the side-effects of lidocaine include excitement, hallucinations, distorted perceptions, changes in heart rate and dyspnoea (laboured breathing). Excessive doses may even cause methaemoglobinaemia (an inability of the body to use oxygen properly).

For 25 years, we've had laboratory evidence that runs contrary to the prevailing view showing that a local anaesthetic can convert into toxic metabolites in human tissues before it gets to the organs of metabolic excretion such as the liver (J Pharmacol Exp Ther, 1972; 180: 454–63). Nevertheless, according to Nickel, the implications of this evidence are still widely ignored.

Dr Nickel himself conducted a case-control study of nearly 5000 patients who'd received oral surgery and discovered that paraesthesia, or 'pins-and-needles'—a well-known complication of oral surgery in 1 to 5 per cent of cases—was actually a toxic side-effect of local anaesthesia

(Anesth Prog, 1990; 37: 42–5). The real significance of Nickel's study is that it again shows that dental anaesthetics do convert to aniline in the body.

The Anesthetic and Life Support Drugs Advisory Committee, an arm of the US Food and Drug Administration (FDA), has given a nod to this by ruling that the following warning should appear on EMLA, a skin cream which contains lidocaine and prilocaine: "Metabolites of both lidocaine and prilocaine have been shown to be carcinogenic in animals."

Yet, that warning has not been extended so that patients are told about the risk of dental anaesthetics.

Some of the most compelling human work by Dr Nickel concerns a review by his research team of 30 cancer patients at a local hospital. All the patients had total body scans, which also revealed their full dental history. These scans demonstrated that each patient had undergone between 12 and 28 crown and bridge dental procedures, which would have meant extensive exposure to local anaesthetics.

Even if you don't develop cancer, the many side-effects of aniline poisoning (that is, ingesting more than one gramme) include headache, paraesthesia, polyneuritis, dizziness, convulsions, muscle weakness, hypotension and irregular heart rhythms. One study says that a form of aniline can induce allergies.

At the moment, research such as that conducted by Alfred Nickel is thin on the ground, and much of the evidence represents his own investigations. Nevertheless, it should act as a red flag to any dentist who automatically dispenses anaesthetic for every tiny filling. A good dentist will try to avoid anaesthesia for minor work or fillings which won't hurt too much.

If you are concerned, ask your dentist to follow the lead of many holistic dentists in the US, who have switched from using aniline-based anaesthetics to intravenous Demerol.

Fissure sealants

Fissure sealants—a composite filling used to seal off fissures in the back teeth—is all the rage now among dentists to prevent future decay in children. However, this practice has been called into question by dentists in the wake of controversy over the potential of composites to give off

oestrogen-like substances, albeit in infinitesimal amounts. The question is whether this practice could in any way reduce future fertility in boys or interfere with the menstrual cycle in girls. With no research on the subject, we can't say for certain.

Jack Levenson always maintained that fissure sealing isn't necessary. As long ago as 1911, a survey in New Zealand of 1500 schoolchildren found that if they ate alkaline, saliva-producing food after a meal, that food would neutralise the acidity of bacteria. This reduced the incidence of tooth decay enormously. One of the best alkaline saliva-producers is fruit.

Levenson also believed that children's teeth are becoming decay-free because parents are more careful about limiting sweets and providing a good diet. It may also have to do with the fact that dentists no longer automatically fill the fissures in the back teeth with amalgam.

Twenty years ago, he said, dentists (including himself) were taught 'extension for prevention'. This practice held that a person's back teeth were bound to rot anyway so the best thing to do was to automatically fill those back-teeth fissures with amalgam to 'extend' the tooth's life. Often, the tiniest prick found by the dentist's probe would prompt a back-tooth filling.

"Hundreds of thousands of teeth were filled unnecessarily," said Levenson. And once a tooth was filled, it caused even further decay.

This practice still goes on in Yugoslavia and, Levenson suspected, may still be being taught at one or two English universities.

Avoiding sugary drinks like Ribena and too many sweets, engaging in regular brushing and eating fruit after meals will go along way towards preventing tooth decay naturally, Levenson believed. "If children eat the right food, it will also remineralise teeth."

Dental implants

Often, when a patient loses a tooth, the latest solution is a tooth implant, a plastic prosthetic tooth that is held in place by a metal post implanted directly into the jawbone.

Jack Levenson pointed to the work of the Bristol Wear Debris Analysis Team (J Bone Joint Surg, 1994; 76B: 701–12), whose research suggested a link

between metal debris and disease. They discovered that particles of metals such as nickel, chrome, titanium and cobalt (in this case, from joint replacements) had worked their way into the liver, spleen, lymph nodes and bone marrow.

If a metal implant is inevitable, London dentist Robert Hempleman strongly recommends that you have all other metals in your mouth (and elsewhere) removed first. A metal implant may interact with the metal fillings in your mouth and create an electrical current which may increase the amount of mercury released from any existing fillings. These electrical currents may also interfere with brainwave patterns.

Jack Levenson recommended a titanium implant, as this causes fewer allergic reactions. He stressed, however, that some individuals are highly allergic to this particular metal.

Robert Hempleman says that the better alternative, in terms of your long-term health, is to have a good denture made instead of an implant.

Tooth decay in young children

A rare, but well-recognised, problem with some breastfed children is the appearance of dental caries in the primary teeth, often referred to as 'nursing caries'. Although the cause is thought to be linked to extended breastfeeding, particularly night nursing, there is little research to verify this. Certainly, there is little in the breastfeeding literature to explain why some night-time nursers develop cavities while others do not.

The likely explanation is the difference in the vulnerability of individual children's teeth and the environment in which they live.

Sometimes, if the mother has extensive dental work during pregnancy or while breastfeeding, it is possible that the bacteria that cause dental caries were passed from the mother to the infant when the first teeth erupted.

A tooth is essentially a hollow piece of bone covered by an enamel cap. Cavities appear when acid-producing bacteria etch away at the enamel coating. While many types of cavities appear on the rough or grooved surfaces of teeth, nursing caries tend to develop on smooth surfaces. This decay pattern is believed to be infectious and passed on by saliva-to-saliva contact.

If the mother has a history of extensive tooth decay, she could easily be passing on these 'bad' bacteria by sharing spoons, cleaning pacifiers with her mouth or allowing her saliva to come into contact with her infant's teeth in some other way (Pediatr Dent, 1994; 16: 110–6; Scand J Dent Res, 1990; 98: 193–6). The percentage of individuals carrying these very high-acid-producing bacteria is only 20 per cent, so it's likely that at least 80 per cent of infants can and do sleep at the breast without developing tooth decay.

If your child does have high-acid-forming bacteria in the mouth, the best treatment is careful management of the oral flora. From a dentist's point of view, this means careful attention to brushing even these primary teeth, particularly if you don't wish to limit nighttime feeding. Once your child's teeth erupt, you should try to brush or wipe them with a damp cloth after each feeding or at least three to four times a day.

A mother who has had extensive dental work may wish to consult her own dentist to help her limit the amount of high-acid-forming bacteria in her mouth, thus protecting her child even further.

Other elements influence a child's vulnerability to caries. Exposure to toxins—particularly the heavy metal lead—in the womb has been shown to predispose a child to the early appearance of dental caries whether or not he is breastfed.

There is a great deal of literature on prenatal exposure to lead and the eventual appearance of dental caries in children. Lead exposure *in utero* has been linked to a weakening of the teeth, and a predisposition to dental caries in both animal and human models (Nat Med, 1997; 3: 956; Pediatr Dent, 1992; 14: 158–66). Among other places in the body, lead is stored in the bones and mammary glands; thus, a vulnerable tooth may be under attack from both within and without. Lead levels in teeth have long been considered a reliable indication of the body's total lead content (Nature, 1972; 235: 111; Arch Environ Health, 1975; 30: 483–6; J Pediatr, 1960; 60: 224).

If you believe that lead may be a problem, you can control the amount of lead your child ingests now. Remember that children are more affected by toxins than adults. Where adults absorb an estimated 5–10 per cent of ingested lead, children can absorb up to 50 per cent.

- Make sure you run the tap for a couple of minutes before you use

the water (especially important in soft-water areas, where lead is washed off in greater quantities)
- consider having any old lead pipes changed to a copper type
- try to avoid going out with your child on heavily polluted days
- boost your intake of protective minerals such as zinc, kelp and apple pectin
- if you can, eat organic fruits and vegetables (and *never* eat the ones sold on busy, polluted roadsides).

7
Root Canals

Dr Weston Price, a former Director of Research for the American Dental Association, spent 35 years in the first third of this century researching systemic diseases of the heart, kidney, uterus, nervous system and endocrine system resulting from toxins seeping out of root canal-filled teeth. Some people are highly sensitive to the toxins trapped within these dead teeth.

Dr Price saw many truths that even today we have a hard time seeing as we are bogged down in the 'but-we've-always-done-it-this-way' kind of thinking. His observations led him far beyond the accepted remedies of his day—which, incidentally, were based on the same fundamentals that are the foundation of today's root-canal treatments. He researched 24 of those fundamentals and found each one to be lacking.

Root-canal fillings (which fill up the space formerly occupied by the nerve) can be done in two ways.

Usually a hole is cut from the top of the tooth into the nerve chamber and the chamber is filled through the hole. But another method is used when the abscess is further advanced. This involves cutting through the bone at the root end, clearing out all the infected material there and then, sealing off the root tip and sewing the area together. Bone will then grow to fill in the defect.

And what is the material usually used to seal the pulp chamber at the root tip? Amalgam.

'Retrograde filling' is the term applied to this type of root canal-sealing process. This means that mercury then has direct access to the body fluids and can cause problems similar to those created from amalgam in the mouth. The only difference is that the fillings in the mouth are much easier to replace than these root-canal fillings.

All the age-old common concepts about root-canal fillings were challenged by Price in such respected dental publications as the *Journal of*

the American Medical Association and the *Journal of the American Dental Association*. He disputed that:

- X-rays reveal the presence of infections
- infections express themselves as bone absorption
- a given dental infection will express itself in a similar way in all people
- if pus is flowing from the tooth, it is very dangerous to the patient
- local comfort and the efficiency of treated teeth are the evidence and measure of the success of a root-filled tooth.

The toxin threat

What did Price find that convinced him that some people could not tolerate root canals?

First, he observed that if he removed root-filled teeth from people suffering from kidney and heart disease, in most cases, their symptoms improved.

In an effort to establish a relationship between the tooth and the disease, he inserted the root-filled teeth under the skin of rabbits. (Rabbits are used because they have a similar immune system to humans.) In fact, a normal, non-infected human tooth (such as one removed for orthodontic reasons) can be left under the skin of a rabbit for a year with practically no reaction. A thin film will form over it but, microscopically, no rejection cells are present.

However, when a root-filled tooth was implanted under the skin of a rabbit, the rabbit died within two days, sometimes in just 12 hours. Price then took a small fragment of the tooth and inserted it under the skin of a rabbit. In two weeks, the rabbit lost over 20 per cent of its body weight and died of heart or kidney disease, depending on the illness of the human donor.

To further confirm this observation, he removed the fragment and transferred it to another rabbit. Within two weeks, he observed the same reaction in the second animal. In one case, he reimplanted the same tooth fragment in 100 rabbits, and each in succession died of the same disease that the human had (in most cases, he transferred the fragment only 30 times).

As obvious as the consequences were, dentists persisted in placing root-canal fillings. Price's work, of course, caused a heated argument among the dental profession and, soon, Dr Percy R. Howe published a paper in the *Journal of the National Dental Association* that rejected Price's findings.

In his research, Howe injected large amounts of streptococcal bacteria into rabbits and found no adverse reactions. This 1920 publication is still used as proof that root-filled teeth are not harmful to humans.

Price investigated the methods used to sterilise root canals (similar to today's technology) and found that teeth retained their sterility for only about two days. Most lost it in less than 24 hours.

But where are these bacteria hiding? A tooth contains enamel, dentin and a central pulp chamber. This central pulp chamber can be sterilised to a reasonable degree by removing its contents of nerves, arteries and veins. Dentin, however, is composed of thousands of tiny tubules. Microscopic in size, these tubules are able to house billions of bacteria. If you could take the dentin tubules from a front tooth and lay them end to end, they would extend for three miles.

Where do these bacteria come from? They are normal inhabitants of the mouth. When a tooth becomes decay-prone, the resident bacteria invade the tooth and start killing the tissues of the tooth. When they reach the pulp chamber, they invade not only the pulp tissue, but also the dentin tubules.

So, when a dentist cleans out the pulp chamber, he removes all the bacteria in that chamber, but the little guys that entered the tubules are still there. Then, when the dentist seals off the tooth, that's when the real trouble starts.

In such an anaerobic situation—in other words, one that contains no oxygen—the streptococci (specifically, diplococcal and short-chain strains from the viridans group) undergo a slight change in form and metabolism to adapt to this new environment.

Now, instead of producing slightly offensive waste products, these transformed bacteria produce a potent poisonous toxin. Although the cells of the immune system cannot enter the tiny hole in the outside of the tooth root to destroy the bacteria, the toxins inside it can seep out.

Also, fluids containing nutrients can seep into the tooth, so the bacteria continue to feed and thrive in confinement.

If the body launches a major fight against these toxins, then pus will form around the tooth. Conventional wisdom says that pus is bad for the patient, and we must give antibiotics until it is gone. Price found that the pus was nearly sterile and, although somewhat unpleasant for the patient, it was a sign of successful quarantine of the toxins from the tooth.

Price also pointed out that X-rays frequently miss abscesses that lie on the front or back of a tooth. About 30 per cent of teeth have extra canals that may exit anywhere from halfway down the tooth to all the way down. They can also lie at the front, back or side of the tooth. The 'extra' canals that abscess are the ones apt to be missed on X-rays.

If the body's immune system is compromised, then very little action is initiated around a root-filled tooth. Certain enzymes may escape and stimulate the bone to form what is termed a 'condensing osteitis' around the tooth. This growth is heavier than usual bone, and it may actually fuse the surrounding bone to the tooth.

On X-ray films, this will appear to be what is considered excellent healing. This tooth will give no local trouble as far as pain and pus are concerned, but the toxins that seep out will get into the blood circulation and, with little immune system interference, will seek out a specific organ to attack. This is called 'tissue localisation'.

Price had demonstrated this when he transferred sections of root-filled teeth from one animal to another, generating the same disease with each transfer.

Many people have root canals that don't give problems. Is it possible to distinguish between the susceptible and non-susceptible patient? Price recorded 140,000 determinants in some 1200 patients to come up with the answer. The bottom line is heredity.

If your biological ancestry for two generations back—including brothers and sisters of your grandparents—was resistant to degenerative disease, then you are not likely to be affected by root-canal fillings.

On the other hand, if there is a family history of a high frequency of heart and kidney problems, diabetes or reproductive disorders, then you may well be susceptible.

Price also determined that different kinds of stress tended to push people over the threshold to where root canals become a problem.

He found that the two biggest stresses were pregnancy and influenza. Under the influence of either, the toxins from root-filled teeth were much more apt to produce disease at the given individual's particular site of susceptibility. Other stresses that upset root-filled teeth were grief, anxiety, chills, severe hunger, and acute and chronic infections.

Bleaching your mouth out

Dentists still regularly use sodium hypochlorite for root-canal irrigation because it is an effective antimicrobial agent. It is the irrigating solution of choice in dentistry, and the conventional view is that it is safe, and no more of an irritant than the usual saline solution, provided it is handled with care.

There are dentists who use it with hydrogen peroxide which, they believe, neutralises any danger. But this might be just wishful thinking. Sodium hypochlorite is the chemical name for household bleach (NaOCl—one atom each of sodium, oxygen and chlorine).

Not surprisingly, some dentists regard it as toxic and dangerous. Common reactions to it include gastrointestinal irritation with nausea, vomiting and diarrhoea, but usually only if the solution is swallowed. A high-concentration solution of sodium hypochlorite can result in corrosive burns to the skin or gums, and eye damage.

However, inhalation of sodium hypochlorite can cause burning in the throat and coughing due to the chlorine gas. High exposure can lead to swelling and obstruction of the airways. Congestive heart failure and pulmonary oedema are rare reactions, but can occur from just inhaling the solution.

Dentists should immediately check a patient's lung function and carry out a chest X-ray if there is even a moderate reaction to the solution.

Extraordinarily, some dentists inject the solution into the gums. One website warns dentists: "There generally is an immediate severe burning sensation often accompanied by very rapid gross swelling."

What if you have a root-canal filling and want it removed? You can't just pull the tooth because this might give you more problems than

before. When such teeth are removed, the attachment between the tooth and the bone—called the 'periodontal ligament'—must be removed with a dental burr at the same time. This irritates the old bone, stimulating it to form new bone.

At the University of Colorado when Hal Huggins was finishing his master's degree, he looked at biopsies of bone from under the root-filled teeth that he'd removed. The lymphocytes of autoimmune disease were embedded at least one millimetre into the bone, and sometimes more.

All this must be removed if good bone healing is to be achieved.

8
Fluoride

What would you say if you heard that the government planned to contaminate the public water supply with an agent that has been associated with cancer, genetic disorders, brittle bones and mottled teeth?

For around 10 per cent of the population in the UK and 50 per cent in the US, this is already happening.

In these areas, fluoride is routinely added to the water supply on the basis that it strengthens teeth and protects against cavities. Fluoride has long been regarded as a dental cavity preventative but, increasingly, this premise is being challenged all over the globe.

The enemy in disguise

The prevailing wisdom used to be that fluoridation led to a dramatic reduction—of up to 60 per cent—in decayed, missing and filled teeth among children. More recent studies have revised this figure downwards to 20–40 per cent. And evidence from New Zealand and Canada suggests that levels of tooth decay may be higher in fluoridated areas.

Writing in 1984, John Colquhoun, New Zealand's former Chief Dental Health Officer, said: "When any unfluoridated area is compared with a fluoridated area of similar income level, the percentage of children who are free of dental decay is consistently higher in the unfluoridated area."

Dental filling levels are more likely to be related to levels of income rather than of fluoride, Colquhoun concluded, following a government study of more than three-quarters of the New Zealand population. Colquhoun was originally responsible for implementing fluoridation in New Zealand, but later became a staunch antifluoridationist.

No one disputes that too much fluoride is harmful to teeth. The debate is simply about how much is too much and what other harm it may

cause.

Even fluoride proponents concede that—whether from fluoridated water, toothpaste, tablets or any other source—excessive fluoride leads to fluorosis, a condition in which teeth become pitted, mottled and eventually destroyed.

Yet, even as early as the 1930s, H.T. Dean of the US Public Health Service observed that susceptible individuals, particularly those with a poor nutritional profile, would suffer mottling at lower doses of fluoride than the supposed optimal daily level of 1 mg.

Fluoridating the water supply makes a fundamentally simplistic assumption: that all the people drinking it—no matter what their size, age or state of health—require the same fluoride level.

The supposed 'optimal' daily amount of 1 mg has somehow become translated into a belief that the water supply should be fluoridated at 1 ppm (part per million) (Department of Health Report on Health and Social Subjects, October 1991).

Such a blanket approach ignores the fact that there is no control over how much water people consume, that fluoride is widely available from other sources and that thirsty children weighing two or three stone (28–42 pounds) could be receiving the same amount of fluoride as adults four times their size.

Fluoride also accumulates in the body from a number of natural sources. Tea is a major source of fluoride even when made with non-fluoridated water. In its report, the Department of Health recognised that: "Those consuming large volumes of tea would have an intake of 4.4–12.0 mg depending on whether tea was prepared from fluoridated water."

These levels are considered far above those generally recognised as safe.

In the magazine *Health for All* (January 1970), researcher H.A. Cook recorded instances of individuals suffering from fluorosis as a result of tea-drinking alone. He conducted a study which found that tea-drinking children take in levels of fluoride more than twice as high as the recommended daily dose.

Fluoride is also absorbed through the lungs from industrial air emis-

sions, and any foodstuffs grown, manufactured or cooked in fluoridated areas will contain large amounts of it. Even Teflon cooking utensils may be a source.

Large amounts of fluoride are ingested from toothpaste and mouthwashes. A 1988 Indian study—albeit in rabbits (Fluoride, 1988; 21: 167–70)—found that toothpaste can double the level of fluoride in the blood within five minutes of use. Even when the toothpaste is not swallowed, it is absorbed into the blood directly through the tongue and cheeks.

Despite this, toothpaste manufacturers continue to increase the current high levels of fluoride—up to 1450 ppm—with no warning detailing how their products should be used or how much fluoride they contain.

And, of course, children, who tend to swallow toothpaste, can end up ingesting excessive—even lethal—levels of fluoride.

Dentists routinely recommend fluoride tablets for children without ever testing to see whether their fluoride levels are actually low and with no training in how to recognise existing fluoride damage.

Fluoride tablets are a major source of fluorosis, according to a Danish study of 56 children who regularly took them: "Almost half showed dental fluorosis to some degree," concluded the authors (Commun Dent Oral Epidemiol, 1989; 17: 204).

These tablets can also kill. One reported case involved a three-year-old Viennese boy who collapsed and died after accidentally consuming the equivalent of 16 mg / kg body weight of fluoride tablets (Int J Clin Pharmacol Ther Toxicol, 1982; 20: 334–8).

In 1991, Lincolnshire-based Dr Peter Mansfield set up the UK's first laboratory to test individual fluoride levels. According to results from the first 100 people he tested—most of whom came from areas where the water is not fluoridated—one in four people in the UK is in danger of overconsuming fluoride.

"Far from being deficient in fluoride, the British public is in danger of consuming too much," he says.

The great problem with overconsumption of fluoride is that only around half of what is ingested is excreted from the body, in the case of healthy adults. However, in children, diabetics or those who have kidney problems, up to two-thirds of the fluoride they take in may

be retained.

This buildup in the body of what Mansfield calls "a poison—full stop" is associated with a host of other problems, including cancer.

An American study sponsored by the government's National Toxicology Program (Lancet, February 3, 1992) found evidence of numerous cancers in rats and mice after exposure to low levels of fluoride. The researchers reported bone or bone-related cancer, liver / bile cancer, oral lesions, abnormal cell changes and metaplasia (replacement of one type of tissue with another).

Despite these findings, the US Public Health Service reaffirmed its faith in the safety of fluoridated drinking water by concluding that the NTP findings were equivocal.

Others disagreed, notably William Marcus, chief toxicologist for the US Environmental Protection Agency's drinking-water programme, and Dr Robert Carton, an environmental scientist in the EPA's Office of Toxic Substances.

Both Marcus and Carton publicly accused the PHS of underplaying the dangers of fluoride. Some 35 dentists have now mounted a lawsuit against the American Dental Association, claiming that it has consistently released misinformation on fluoridation.

Dr David Kennedy, one of these dentists, says: "I think it is criminal to expose large groups of the population to toxic substances without any evidence of safety. The proponents of toxic dentistry claim that you can't prove the agent caused a specific problem . . . It is not our responsibility to prove that a poison is not a poison. It is the responsibility of the person who applies the poison to prove that it is harmless . . ."

While evidence of a link with cancer is relatively new, the link between fluoride and brittle bones is well established. Fluoride that is not excreted accumulates in the bones (*Fluorides and Human Health*. Geneva: WHO, 1970; *Fluorine and Fluorides. Environmental Health Criteria, No 36*. Geneva: WHO, 1984). This accumulated fluoride serves to increase the bone mass but, although the bones become more dense, they are also more brittle.

There have been numerous studies showing an increased incidence of hip fractures in the elderly in areas with fluoridated water (JAMA, 1992; 268: 746–8; JAMA, 1990; 264: 500–2; JAMA, 1991; 266: 513–4; Am J Epidemiol 1991; 133: 649–60).

Yet, despite this solid evidence, fluoride is still prescribed as a treatment for osteoporosis. The medical rationale is that, because fluoride increases bone density, it ought to be able to reverse osteoporosis, a condition where bones become porous and less dense.

Dr C. Danielson, who headed on such study team in Utah, concluded: "Exposure to fluoride apparently causes new bone formation of an inferior quality, especially in the femoral head where there is more cortical bone . . . its compressive strength increases, but its tensile strength decreases."

In other words, here again, fluoride may make your bones thicker, but they'll break more easily.

Fluoride buildup can also affect your immune system. Dr Sheila Gibson, a research physician at the Glasgow Homeopathic Hospital, tested the effect of low levels of fluoride on the action of leucocytes—infection-fighting white blood cells. She found that fluoride concentrations well below those recommended as 'optimal' for adding to the water supply (1 ppm) inhibited leucocyte activity.

Gibson's work refutes the claims that fluoride has no adverse physiological effects below a concentration of 10 mcg / mL.

"It is, however, more likely that fluoride affects cellular metabolism at all concentrations but that, in some systems, this effect is not detectable until doses in excess of 10 mcg / mL are reached," she says. "The present series of experiments clearly demonstrates effects of fluoride as low as 0.5 mcg / mL."

Gibson says that this action affects the ability of the immune system to function efficiently which, in turn, reduces resistance to infection as well as increases susceptibility to cancer and immune-depressed states such as post-viral fatigue syndrome and AIDS.

"The effect on individuals already suffering from such immune-depressed conditions is likely to be serious," she concludes.

Industrial fluoride

The issue of artificial fluoridation of water is complicated by the high fluoride levels in the diet and in drinks.

Since World War II, the use of both organic and inorganic fluoride

compounds in industry has burgeoned, as has industrial fluoride pollution. You cannot burn a piece of coal without liberating fluoride. Even fluoride dust taken in through the lungs can lead to dental fluorosis.

Natural fluoride—known as 'cryolite', a sodium aluminium fluoride—is used in aluminium production. Apatite—a calcium and fluoride-containing phosphate complex—is used as the raw material for phosphate fertilisers. Fluorides have also been used for many years as insecticides and rodenticides, which is why many opponents of fluoridation still like to describe fluoride as 'rat poison'.

Fluoride has been introduced into various pharmaceutical drugs, including steroids, the synthetic oestrogens used in the Pill and, most recently, antibiotics.

Fluorinated anaesthetics—often called 'halogenated' anaesthetics—can give off high concentrations of inorganic fluorides when metabolised in the liver, according to Professor Philippe Grandjean, a top international fluoride expert and World Health Organization (WHO) scientist from the Institute of Community Health at Odense University, Denmark.

An apple contains between 0.22 and 1.30 ppm fluoride, according to the WHO, but the fluorine-containing insecticide sprayed on the tree producing the apple may add another 1 mg of fluoride to the fruit—and to your bodily load.

In *Fluoridation: The Great Dilemma* (Lawrence, Kansas: Coronado Press, 1978), Dr George L. Waldbott and his co-authors warned that baby foods can contain up to 18 ppm of fluoride—enough to produce mottled teeth—and that the fish-protein concentrate distributed to people in the underdeveloped countries may contain up to 370 ppm.

Others, such as the British dentist Dr Geoffrey E. Smith, who now lives in Australia, point out that infant milk formulas made up with fluoridated water can contain up to 100 times the amount of fluoride that would be obtained from mother's milk.

Even the fluoride preservatives in cheap wines have been shown to cause wine fluorosis in heavy drinkers, according to a frequently quoted paper published in 1966 by M. Soriano from the University of Barcelona.

Modern estimates of dietary fluoride intake by fluoride promoters tend to hark back to a 1943 study by F.J. McClure of the American

National Institute of Dental Research. He found that the typical American adult obtained 0.3–0.5 mg of fluoride a day from food. Independent scientists such as the late John Marier of the Division of Biological Sciences at the National Research Council of Canada claim that diet alone may contribute up to 5.5 mg of fluoride a day.

The average consumer would be hard put to judge their fluoride intake today. Official guidelines on 'optimal' doses for dental purposes, on 'safe and adequate' doses, and even on toxic and lethal levels are also confusing, and vary from country to country and from one scientific institution to another.

"Fluoride," wrote Canada's John Marier in a major fluoride report in 1977, "is a persistent bioaccumulator, and is entering into human food and beverage chains in increasing amounts."

Some of the fluoride ingested may be stored in bone for a long time before being slowly released. The half-life, or average turnover rate, can be as much as nine years, which means that both dental and medical effects can be caused by much earlier exposure, and need not be related to the toothpaste, tablets or drinking water being used when the symptoms first appear.

There is also the problem of biotransformation in the body whereby organic fluorine compounds belonging to the fluorocarbon group can release inorganic fluorides through bacterial metabolism and degradation. For many years, these fluorinated hydrocarbons were regarded as stable and inert. Today, however, many scientists in fields such as organic chemistry insist that few organofluorine compounds are biologically stable.

Magnesium is at the very centre of the body's reactions to fluoride from all sources. Fluoride chelates (chemically latches on to) magnesium in the body, making the magnesium unavailable for its many functions. Magnesium, in turn, protects against fluoride toxicity.

As Marier put it in a paper presented in 1979 to dentists at the University of Kuopio in Finland: ". . . the toxic effects of fluoride [are] a direct function of the severity of the magnesium deficiency. Thus, very low levels of dietary fluoride are toxic at ultralow levels of dietary magnesium whereas much higher levels of fluoride are innocuous when

dietary magnesium is increased."

It is clear that many people can consume rather high amounts of fluoride from both natural and industrial sources without developing mottled teeth or fluoride-related medical afflictions. The reason for this is that fluoride can be chelated not only by magnesium, but by other naturally occurring metals, which means that its bioavailability is low.

Increase in fluorosis

The widespread fluoridation of water has led to an increase in fluorosis. This tooth mottling and discoloration, resulting from fluoride excess, affects 48 per cent of people living in areas with fluoridated water supplies (NHS CRD Report no 18, 2000).

New data from the US (J Am Dental Assoc, 2002; 133: 157–65) have confirmed the association.

The researchers analysed data on fluorosis from the National Institute of Dental Research's (NIDR) survey of dental caries in school children (1986–87) as well as data from the 1930s, looking for changes in the incidence of fluorosis.

In 2002, the Systematic Review of Water Fluoridation published its report. The key finding was the poor quality and quantity of acceptable evidence. Only 24 studies of dental benefit and 88 studies of fluorosis qualified for review. In general, these studies indicated that fluoridation inflicts on teeth at least as much harm as good. For every mouth cleared of dental decay by fluoridation, another develops fluorosis of 'aesthetic concern'—in other words, bad enough to justify cosmetic correction.

The benefit is far less, and the harm much more, than have been claimed. The highest incidences of fluorosis occurred where water was naturally fluoridated or where fluoride had been added. The lowest incidence was in areas where water was not fluoridated.

However, say the researchers, water may not be the biggest problem. Fluoride overexposure is aggravated by other sources, including those not intended to be consumed, like toothpaste.

This fact may explain why the largest increase in the incidence of fluorosis was found among children living in areas where the water is

not fluoridated (J Am Dental Assoc, 2002; 133: 157–65).

Despite this known side-effect of water fluoridation, the cosmetic dental treatment required for one in every eight cases is not covered by the NHS. It can cost £200 per tooth to 'correct' fluorosis and the procedure has to be repeated at least every six years.

Avoiding fluorosis

As well as being a well-documented cause of mottled teeth, fluoride overload is also associated with a range of other symptoms.

In his book, *Fluoridation: The Great Dilemma*, the late Dr Waldbott lists the following symptoms as indicative of fluorosis. Their severity and duration depend on age, nutritional status, environment, kidney function and susceptibility to allergies.

- Chronic fatigue not relieved by extra sleep or rest
- Headaches
- Dry throat and excessive water consumption
- Frequent need to urinate
- Aches and stiffness in muscles / bones
- Muscular weakness and spasms
- Gastrointestinal disturbances, including diarrhoea and constipation
- Pinkish-red or bluish-red spots on the skin which fade after about a week
- Skin rash or itching after bathing
- Dizziness
- Visual disturbances.

✔ If you are displaying what you believe are symptoms, have your fluoride levels tested. Currently, this test is only available from Good Healthkeeping in Lincolnshire at £15 and £8.50 for a follow-up test (01507 601 655)

✔ If you live in a fluoridated area, one way to avoid fluoride is to fit a reverse-osmosis water purifier in your home (again available from Good Healthkeeping at around £300, plus the cost of renewing the filter membrane every six months)

- ✔ Another possibility is to pay for a service that will deliver bottled mineral water and supply a dispenser for £20–30 a month
- ✔ Reduce your intake of tea and soft drinks; drink herbal tea made with non-fluoridated water instead
- ✔ Switch to a non-fluoridated toothpaste. Never let children use 'adult' fluoride toothpastes
- ✔ Check your nutritional status. A poor diet will only increase your susceptibility to symptoms of fluoride poisoning. Adequate levels of magnesium, zinc and iron will help your body counteract the effects of fluoride
- ✔ Watch your consumption of prepared frozen foods, particularly vegetables
- ✔ Never use fluoridated water for baby formula (another good argument for breastfeeding).

9
Fluoride: Damning Evidence

The government and the dental profession have convinced the public that fluoridated water offers nothing but benefits—that there is overwhelming evidence that it prevents tooth decay and contributes to the strength of bones.

There is tacit admission in the pro-fluoride camp that fluoride can also cause harm, but only at high levels—more than 2 ppm (parts per million) in water may cause mottled teeth, and over 8 ppm may lead to bone disorders and degenerative changes in the vital organs.

A few lone voices have countered this prevailing view with published evidence that fluoride can have devastating effects, causing mottled teeth and osteoporosis at very low levels. While much has been written about the effects of too much fluoride on teeth and bones, little is known of the effects of fluoride on the rest of the body.

Evidence has emerged to demonstrate that fluoride can have devastating effects on just about every organ in the body, and may even be partly responsible for behavioural problems such as hyperactivity and many puzzling illnesses like ME (myalgic encephalomyelitis, or chronic fatigue). Like mercury, fluoride isn't an obvious choice for dental health as it's a poison—more poisonous than lead and only slightly less poisonous than arsenic (Clin Toxicol Commerc Prod, 1984; 11: 4, 112, 129, 138). The fluoride used in toothpaste, mouth rinses and dental gels is usually sodium fluoride, a waste product from the aluminium industry. The fluoride added to our water supply is hydrofluorosilic acid or sometimes silicofluoride—waste products of the fertiliser and glass industries.

Soft tissue damage

The late American fluoride critic George L. Waldbott discovered that, besides teeth and bones, fluoride can damage soft tissue. According to

his research, the small fluorine ion with its high-charge density can penetrate into every cell of the body and combine with other ions (Waldbott GL *et al. Fluoridation: The Great Dilemma*. Lawrence, KS: Coronado Press, 1978: 148–74). It also interferes with the metabolism of calcium and phosphorus, and the function of the parathyroid glands.

Fluoride has a strong affinity to calcium, and can also readily combine with magnesium and manganese ions, and so interfere with many of the enzyme systems that require these minerals. The interruption of these enzymes, in turn, may disturb carbohydrate metabolism, bone formation and muscle function. Indeed, every vital function in the body depends on enzymes and, because fluoride is able to reach every organ, many diverse toxic symptoms can result.

Fluoride and enzymes

Different enzyme systems react to fluoride in different ways: some are activated; others are inhibited. Lipase (essential for the digestion of fat) and phosphatases (needed to breakdown phosphates) are very sensitive to fluoride. In patients with skeletal fluorosis, succinate dehydrogenase activity is inhibited. In chronic fluoride poisoning, this diminished enzyme activity accounts for muscular weakness and even muscle wasting.

Human salivary acid phosphatase is cut by half when exposed to 3.8 ppm of fluoride. The blood enzyme cholinesterase is inhibited by 61 per cent on exposure to 0.95 ppm of fluoride—an amount within recommended levels, but which has an adverse effect on nervous system function (Smith PA, ed. *Handbook of Experimental Pharmacology*. Berlin: Springer-Verlag, 1970: 48–97).

Alkaline phosphatase, an enzyme involved in bone growth and liver function, may also be affected by low-level fluoride intake.

According to scientists from the University of California at San Diego, fluoride switches off the enzyme cytochrome *C* oxidase, an oxygen-carrying respiratory enzyme. Deficiencies of this vital enzyme have been linked to cancer, severe diseases and even cot death (J Biol Chem, 1984; 259: 12984–8).

It's also been shown by researchers at King's College in London that

fluoride forms very strong hydrogen bonds with amides, which are formed when amino acids join together to form a protein (J Am Chem Soc, 1981; 103: 24–8). This can cause chromosomal damage and, if the protein is distorted, the body's immune system will no longer recognise it, but treat it as a foreign protein and try to destroy it. This, in turn, will trigger allergic skin or gastrointestinal reactions (Yiamouyannis J. *Fluoride: The Aging Factor*. Delaware, OH: Health Action Press, 1993: 94–9).

Stomach and bowel disorders are the main features of fluoride intolerance. Even small amounts of fluoride can form hydrofluoric acid in the stomach to produce gastric pain, nausea and vomiting. Young children are particularly at risk. Fluoride tablets can even cause stomach bleeding; in one instance, a nine-year-old boy sustained such devastating damage that large parts of his stomach had to be removed (Fluoride, 1977; 10: 149–51).

Links with thyroid disease

The most readily identifiable feature of soft-tissue fluorosis is an extraordinary general fatigue, which is frequently linked to thyroid deficiency. The thyroid gland requires iodine to produce the hormone thyroxine, which controls the rate of metabolism in the body. But when fluorine is present, iodine is displaced, which causes the thyroid gland to stop working properly (Roholm K. *Handbuch Experimenteller Pharmakologie, Ergaenzungswerk, vol 7*. Berlin: Springer-Verlag, 1938: 20).

The parathyroid gland, which regulates the distribution of calcium and phosphorus in the body, is extremely sensitive to excessive amounts of fluoride. Over 50 years ago, doctors in India found an association between skeletal fluorosis and hyperparathyroidism (J Hyg, 1942; 42: 500–4).

Fluoride has even been shown to affect the pituitary gland, which controls growth rate by regulating the production of thyroid hormones (Seances Soc Biol Fil, 1930; 103: 981–2). In animals, less-than-normal amounts of thyroid hormones are produced when animals are given water containing a fluoride content equivalent to that of water fluoridation (Bull Schweiz Akad Med Wiss, 1954; 10: 211–20).

Professor A.K. Susheela of the Fluoride and Fluorosis Research Foundation of India, a consultant to the Indian government, has pub-

lished over 100 scientific papers on the hazards of fluoride. Using scanning electron-microscopic photography, she has proved that, when exposed to fluoride, red blood cells are killed prematurely, thereby lowering haemoglobin and leading to anaemia.

She also showed that calcium levels diminish as fluoride levels in the body rise and the GI tract mucosa is damaged, causing irritable bowel syndrome; blood fluoride levels rise continuously with prolonged use of fluoridated toothpaste.

When people are bombarded with fluoride—whether in the form of fluoridated water, toothpaste or mouth rinses—muscles and elements of connective tissue, particularly collagen fibre and bone tissue, undergo degenerative changes, says Professor Susheela.

At the 1998 US Conference of the International Society for Fluoride Research in Bellingham, Washington, Dr Jennifer Luke from the University of Surrey, UK, presented evidence of the effects of fluoride on the pineal gland in gerbils. In both gerbils and humans, this gland helps control the ageing process and the production of melatonin, which regulates the sleep / wake cycle. Gerbils exposed to a high level of fluoride experienced a significant decrease in the production of melatonin and earlier genital maturation.

While animal studies may not always be applicable to humans, Dr Luke theorises that mass fluoridation may be behind the general lowering of the age of puberty onset seen in the developed countries (Fluoride, 1998; 31: 175).

In areas where water is fluoridated, there is evidence to show that dangerously high fluoride concentrations accumulate in many of the soft tissues and organs, including the heart, kidney and bladder, of the general population. The highest level ever recorded—8400 ppm—was found in the aorta of people living in Grand Rapids, Michigan, where fluoride was first introduced in America.

Effects on the heart

The heart and blood vessels are affected by fluoride. Cardiac irregularities and low blood pressure have been noted in experimental fluoride poisoning using large doses (Publ Health Rep, 1956; 71: 459–67). In 1950, five

years after the experimental introduction of fluoride into drinking water in Grand Rapids, the number of deaths from heart disease nearly doubled.

In addition, death rates due to cancer, diabetes and arteriosclerosis were all markedly increased compared with death rates for the rest of the state (The Grand Rapids Herald, July 28, 1955).

By recording the heart's activity, Japanese researcher Taka Mori showed a direct link between damage to the heart and dental fluorosis in children who drank water with a fluoride content of 0.5–6.2 ppm (Ziegelbecker R et al. Emu Verlags GmbH, Austria: Lahnstein, 1995: 43).

Fluoride affects the brain and entire central nervous system. Neurological problems such as headaches, vertigo, spasticity in the extremities, visual disturbances and impaired mental acuity can all result. Tissue damage to anterior horn cells (cells in the forward-facing section of the spinal cord) has been found (Fluoride, 1975; 8: 61–85).

Official annual statistics revealed that, among malnourished children in the Chilean town of Curico, fluoridated since 1953, death rates were 104 per cent higher than in comparable, non-fluoridated towns. The general mortality rate was higher in Curico by 113 per cent compared with the average for the rest of the country (Ziegelbecker R et al. Emu Verlags GmbH, Austria: Lahnstein, 1995: 47–8).

Fluoride and bone cancer

An association between fluoridation and osteosarcoma, a rare form of bone cancer, in young men has now been confirmed.

Copious evidence shows that fluoride weakens bones. But one study revealed that fluoride even at very low levels has an effect on the male hormone testosterone (IRCS Med Sci, 1983; 11: 813–4), involved in bone growth in boys, but not in girls.

The incidence of this rare bone cancer has increased dramatically in young men, particularly those aged 0–19, in fluoridated areas of the US. But such a rise in the rate of this cancer has not been seen in non-fluoridated areas of the country (US Publ Health Service, 1991: F1–7).

The New Jersey Department of Health also found that osteosarcoma rates were three to seven times higher in fluoridated areas than in non-

fluoridated ones (NJ Dept Health, 8 November 1992).

After careful analysis of much data, the late pioneering health researcher John Yiamouyiannis concluded that fluoridation is linked to a 70 per cent increase in bone cancer, especially osteosarcomas, in men aged under 20.

Fluoride and myalgic encephalomyelitis (ME)

Although few researchers have looked at the role of fluoride in the development of ME, there are conspicuous similarities between key features of ME / chronic fatigue syndrome (CFS) and those seen in the very early stages of fluoride poisoning (Fluoride, 1998; 31: 13–20).

Dr John McLaren Howard, of Biolab Medical Unit in London, offers a few important clues as to why this may be. He discovered that ME patients experience reduced movement of white blood cells when exposed to relatively low levels of fluoride (InterAction 14, Autumn, 1994: 53–4). This effect on white blood cells could render a patient less able to fight infection efficiently or lead to an exacerbation of any health problems present.

Fluoride also interferes with phagocytosis as well as causes the release of superoxide free radicals in resting white blood cells. This means that fluoride slows down and weakens the very cells that serve as the body's defence system. Bacteria, viruses, chemicals and the body's own damaged or cancerous cells are then allowed to wreak havoc. Minor infections will take longer to clear and cause more serious illness (Yiamouiannis J. *The Aging Factor*. Health Action Press, 1993: 32). This is precisely what appears to be happening in many cases of ME.

We do not know how many children or teenagers received topical dental treatment with high-concentration fluoride before succumbing to infections which led to ME / CFS. Tests carried out by Japanese researchers at the Nippon Dental College in Tokyo on the potential hazards of high doses of fluoride showed that levels as low as 57 ppm could induce genetic damage and irregular synthesis of DNA in mammalian cells. These tests were undertaken to assess the hazards of rub-on fluoride products used to prevent tooth decay at concentrations of 9000 ppm (paper presented at a meeting of the Japanese Society for Cancer Research,

August 23, 1982, cited in *The Ecologist*, 1986; 16: 249–52). Varnishes containing 20,000 ppm of fluoride, supposedly to strengthen teeth, may also be applied in future.

Doris Jones' son received fluoride treatment to prevent tooth decay in the autumn of 1979 after which his health dramatically deteriorated, commencing with stomach problems, various minor infections and glandular fever, and followed by atypical measles, more infections and eventually resulting in ME in 1980.

In the end, the fluoride treatment didn't work in preventing tooth decay—he's needed 15 fillings over nine years.

The American pathologist Majid Ali of Columbia University in New York explains that chronic fatigue results from an 'accelerated oxidative molecular injury'. Only a well-functioning enzyme system can protect against such injury and maintain normal energy levels. In ME, there is a high frequency of membrane deformities due to increased oxidative stress on the cell membranes, which is why sufferers lack energy—similar to what happens in fluoride poisoning (Ali M. *The Canary and Chronic Fatigue*. New Jersey: Life Span Press, 1994).

Experienced researchers who have studied ME for decades maintain that, as with polio, it is brought on by damage to anterior horn cells by a gut virus, which explains why polio victims are paralysed or suffer from impaired motor function (Hyde BM *et al. The Clinical and Scientific Basis of ME / CFS*. Ottawa: Nightingale Research Foundation, 1992: 111–6). But fluoride has also been shown to damage anterior horn cells. Gastrointestinal disturbances, often referred to as irritable bowel syndrome (IBS), are also known to play a significant part in ME—just as they do in the chronic fluoride toxicity syndrome.

Severe sleep disturbances, or reversal of sleep rhythm, are a common feature in ME / CFS (Hyde BM *et al. The Clinical and Scientific Basis of ME / CFS*. Ottawa: Nightingale Research Foundation, 1992: 285–91). Deposits of large quantities of fluoride in the pineal gland of animals have caused similar problems (presentation by J, Luke, Bellingham Conference, 1998).

At this point, no one knows just how much these syndromes overlap or to what extent fluoride facilitates the development of ME by various biological agents. The indications are that fluoride may act as a

'facilitating co-factor' and exacerbate existing problems in such patients.

Or it could be, as Dr H.C. Moolenburgh—Dutch author and fluoride critic—suggests, that ME is one of the end-stages of a general chemical poisoning, with fluoride being one of the worse offenders.

Early signs of fluoride poisoning

Researchers examining 112 cases of fluorosis in Ontario, Ohio, Italy and British Columbia found that the following collective symptoms (Fluoride, 1998; 31: 13–20) tended to appear before the bones were affected:

- *Musculoskeletal*: arthritis, especially in the cervical and lumbar spine, muscle pain, pins-and-needles, inability to control extremities
- *Gastrointestinal*: gastric pain, nausea, vomiting, bloating, diarrhoea, constipation, acute abdominal episodes, inflammation of the mouth
- *Neurological*: migraine-like headaches, blurred vision with moving spots, convulsions, muscular fibrillation
- *Respiratory*: nasal and conjunctival problems, emphysema, asthma, nose bleeds
- *Skin*: dermatitis, inflammation around capillary blood vessels
- *Other symptoms*: cough, excess mucus, breathing difficulties, mouth ulcers, bleeding gums, palpitations, vertigo, difficulty sleeping, excessive thirst, excessive urination, frequent episodes of lower urinary tract disease, oedema in hands and ankles, joint pains, stiffness, rheumatic pains, rash, marked mental deterioration (mainly memory loss and ability to concentrate), tinnitus, fatigue and extreme exhaustion; many people also became bedridden.

Fluoride: the evidence against

Does fluoride prevent cavities? In a word—no.

Studies from the US, Canada and New Zealand show no differences in the rates of tooth decay between fluoridated and non-fluoridated areas (Fluoride, 1990; 23: 55–67). Indeed, some studies indicate that the average rates of tooth decay in children are actually lower in non- or low-fluoridated areas (J Can Dent Assoc, 1987; 53: 753–5; Am J Phys Anthropol, 1989; 78: 79–92).

In fluoridated areas, high percentages of the population suffer from

dental fluorosis, where teeth are mottled because of numerous deposits of fluoride. In Birmingham, where water has been fluoridated at 1 ppm since 1964, more than a third of children suffer from dental fluorosis (Health & Homeopathy, Spring, 1998: 24–5).

Effects on the teeth first manifest themselves as pitting and cavities on the surface of the tooth enamel due to demineralisation; this occurs with levels of fluoride as low as 0.5 mg / L or 0.5 ppm.

In India, the water supply in many areas contains high levels of natural fluoride. An estimated 62 million people, including six million children, are afflicted with endemic fluorosis. Concerted efforts are now being made to provide defluoridated water and to educate people on nutritional supplementation to prevent fluorosis.

The German Association of Gas and Water Employees—the very people who were asked to put fluoride into the water supply—prepared a detailed report considering all available evidence. After analysing the data, which was supported by 485 references, the report rejected water fluoridation on eight counts.

The report concluded, in essence, that water fluoridation is foreign to nature, unnecessary, unsatisfactory, illegal (according to two basic German laws), irresponsible, harmful to the environment, uncontrollable and inefficient (Dokumentation zür Frage der Trinkwasser-Fluoridierung, DVGW-Schriftenreihe, Wasser Nr 8, 1975).

Two studies of community water fluoridation have shown that, while there may be small benefits to bone, the effects of high fluoride consumption on children's teeth are still cause for concern.

In the first study, researchers in Oregon collected data on fluoridated water exposure and risk factors for osteoporosis from more than 7000 women. Beginning in 1986, the women underwent bone mineral testing of the lumbar (lower) spine, proximal femur (top of the thigh bone) and radius (forearm).

Among 3218 women with continuous exposure to fluoridated water, bone mineral density (BMD) averaged 2.6 per cent higher at the femoral neck, 2.5 per cent higher at the lumbar spine and 1.9 per cent lower at the distal radius (wrist) than in women not exposed to fluoridated water. Fractures occurred in both groups of women and, while those

with continuous fluoride exposure had slightly fewer hip and spine fractures, they also had more wrist fractures than non-exposed women.

Put into perspective, the small gains associated with continuous fluoride exposure in this study are similar to those seen in women who have increased their dietary calcium and engage in regular weight-bearing exercise (without the still-unknown risks of long-term fluoride exposure).

While the most positive conclusion that can be drawn from these data is that continuous fluoride doesn't appear to increase the risk of fractures, neither does it seem to offer significant benefits (BMJ, 2000; 321: 860–4).

In the second fluoridation study, UK researchers took a wider look at the safety and efficacy of fluoridated drinking water. They took into account the results of more than 200 studies—many of which, the researchers admit, were of low-to-moderate quality.

The results of their review were something of a blow to fluoride supporters, as the overall reduction in tooth decay was smaller than has been previously reported. And among the potential adverse effects of water fluoridation, mottled teeth (fluorosis) remained the most prevalent—and the higher the concentration of fluoride in the water, the greater the risk of fluorosis (BMJ, 2000; 321: 855–9).

Fluoride, hyperactivity and violent behaviour

A number of studies have shown that exposure to fluoride can cause behavioural changes (Int Clin Psychopharmacol, 1994; 9: 79–82; Neurotoxicol Teratol, 1995; 17: 169–77; Fluoride, 1996; 29: 187–8).

At a 1998 conference on fluoride in Washington, Professor Roger Masters reported a link between the blood lead levels of 280,000 children in Massachusetts and the use of silicofluorides for water fluoridation: fluoride increases the toxic effects and absorption of lead. Both in the UK and in the American state of Georgia, behaviour associated with lead toxicity, such as violent crimes, is more frequently reported in communities using silicofluorides than in areas not using them.

At the same conference, Dr Phyllis Mullinix, a neurotoxicologist at the Boston Children's Hospital in Massachusetts, reported on the results

of a study using two steroids to treat childhood leukaemia. One of these steroids had a fluorine atom in its structure, and this steroid caused behaviour patterns typical of hyperactivity.

A follow-up study also showed a significant drop in the average IQ scores of the children given this steroid compared with those taking the non-fluoride drug (Fluoride, 1998; 31: 175).

To test for fluoride poisoning

Contact

- *Biolab Medical Unit* (9 Weymouth Street, London W1W 6DB; tel: +(44) 020 7636 5959/5905; fax: +(44) 020 7580 3910; e-mail: reception@biolab.co.uk) for testing to determine fluoride sensitivity and white blood cell depression
- *Dr Peter Mansfield* (Templegarth Trust, P.O. Box 6, Louth, Lincs LN11 8XL) for a test to measure 24-hour urine output of fluoride. Before taking this test, avoid all fluoridated water (use distilled, other non-fluoridated or low-fluoride water), fluoridated drinks (tea), fluoride-rich food (saltwater fish, gelatine, chicken skin), fluoridated toothpaste, and any other source of environmental fluoride such as cigarette smoke and industrial pollution

If your symptoms are due to fluoride, they should diminish markedly within days or weeks, and will recur on re-exposure to the source of fluoride (Professor A.K. Susheela, October, 1998). If symptoms persist, consult a physician to identify any other possible causes.

10
Fluoride and Mental Health

Studies from China show that an excessive intake of fluoride can accumulate in the brain, permanently reducing a child's intelligence.

Two suburban villages in Shanxi Province in China are very much alike—except for the level of calcium fluoride in their water supply.

Xinghua's water contains 0.91 parts per million (ppm; equal to mg/L) of fluoride, and 14 per cent of the population have dental fluorosis—mottling, softening, and increased porosity and brittleness of the tooth enamel—but no cases of bone fluorosis.

In contrast, Sima has fluoride levels four times higher than its neighbour, or 4.12 ppm. In this town, 86 per cent show clear evidence of dental fluorosis, and 9 per cent have clinically diagnosed skeletal fluorosis (Fluoride, 1996; 29: 190–2).

In each village, 160 randomly selected children (excluding those with congenital or acquired diseases not related to fluoride) took a standard IQ (intelligence quotient) test lasting 40 minutes. Each child's mother had lived in the study village during pregnancy.

The two studies came to extraordinary and identical conclusions: exposure to high fluoride lowers intelligence, as measured by IQ test scores (Chin J Control Endem Dis Suppl, 1991).

The mean IQ in high-fluoride Sima was 97.7 whereas, in lower-fluoride Xinghua, the mean IQ was 105.2—which is 7.5 points or 7.7 per cent higher, a statistically significant difference (Fluoride, 1996; 29: 190–2).

Indeed, the entire range of IQs was lower in high-fluoride Sima, giving that village's bell-shaped IQ curve a distinctly flattened shape (Alive Can J Health Nutr, 1998; 191: 67–8).

Among the 160 children selected for the study, the number of those from Sima with IQs of 69 or below was six times that of the children in

lower-fluoride Xinghua, and 26 per cent fewer children in Sima had IQ scores of 120 or above (Chung Hua Liu Hsing Ping Hsueh Tsa Chih, 1994; 5: 296–8).

A separate Chinese study looked at the IQs of 907 children aged 8–13 years from four areas of Guizhou Province (Chung Hua Liu Hsing Ping Hsueh Tsa Chih, 1994; 5: 296–8). This study compared the degree of fluorosis in the population, rather than the fluoride content of the water. In some areas, fluorosis was worsened by inhalation of fluoride-containing soot from China's low-quality coal.

The maximum IQ among the low-fluorosis students was 140, a good score. However, in students with moderate-to-severe fluorosis, the maximum IQ scores were only 110.

The very large difference in mean IQ scores between the high- and low-fluorosis areas appears to be caused in part by exposure to lead as well as fluoride. Another study in a coal-burning area found that excessive fluoride lowered mental work capacity and zinc content of the blood (Hua His I Ko Ta Hsueh Hsueh Pao, 1994; 25: 188–91).

How fluoride harms IQ

So how does high fluoride reduce a child's intelligence? Sadly, many of our early clues are from animal studies, which may not apply to humans. Those laboratory studies that we do have strongly suggest that fluoride causes motor dysfunction, IQ deficits and/or learning disabilities, and a generalised pattern of disruptive behaviour. Phyllis Mullenix, PhD, the then head of toxicology at Forsyth Dental Center in Boston, carried out major studies in the early 1990s (Neurotoxicol Teratol, 1995; 17: 169–77).

In her tests on rats, the results indicated that fluoride is a powerful central nervous system toxin (Pharmacol Biochem Behav, 1987; 27: 559–64).

[Note: **WDDTY** is opposed to animal studies, but we cite these here because of the tendency of pro-fluoridationists to quote studies using rats. This is because of their supposed far-higher resistance to toxins than other species. Rats also lack a vomit reflex (Section 2, Health effects: Comparative toxicokinetics. Abstracts from *USPHS [Public Health Service] Toxicological Profile on Fluorides*, p 16). In other words, rat studies are used to show that fluoride is harmless.]

Before Mullenix, no one had ever considered—much less studied—the

subtle effects of fluoride exposure on the developing brain. At the time, she was unaware of the ongoing research in China.

Although rats are supposed to resist fluoride (which is ironic for a chemical that started life as a rat poison), Mullenix's tests showed that exposure prenatally, as weanlings or as adults, caused subtle, but real, sex- and dose-specific behavioural deficits with a common pattern. The fluoride accumulating in important regions of the rat brain, especially the hippocampus, increased, the more fluoridated water they drank.

The hippocampus is considered to be the central processor of the brain that integrates input from the environment, memory and motivational stimuli to produce behavioural decisions and to modify memory.

It appears that fluoride accumulates in brain tissue, and younger animals and people are more vulnerable than older ones (Neurotoxicol Teratol, 1995; 17: 169–77). We also know that children excrete fluoride less efficiently than adults and so retain more of it (Aust Trad Med Soc Newslett, 1993/94; Summer).

In these studies, researchers discovered that fluoride caused behavioural problems not unlike hyperactivity as well as learning deficits (Neurotoxicol Teratol, 1995; 17: 169–77). But what was surprising was how little exposure was needed before subtle brain damage could be seen. Indeed, the brain effects were measurable at a lower level of exposure than that required to damage bones.

The researchers also discovered subtle differences between the sexes in the timing of exposure required to cause damage. Male rats were most sensitive to prenatal exposure whereas females were more likely to be damaged if exposed as weanlings or as adults.

The behavioural problems were also different, depending on the time of exposure. Rats exposed prenatally tended to be hyperactive whereas those exposed as young rats or adults tended to have cognitive (mental-processing) deficits.

The level of exposure required to cause damage, and the apparent differences between male and female tolerances to exposure, corresponded with those found in other studies of hippocampal brain damage.

Although animal studies don't necessarily apply to humans, they do provide important clues concerning the damage wreaked by fluoride in

the Chinese study populations. Fluoride blood levels in this rat model (0.059–0.640 ppm) were similar to those reported in children one hour after receiving topical fluoride treatment on their teeth.

A few mechanisms have been suggested as to how fluoride affects brain function. These include influencing calcium currents, altering enzyme structure, inhibiting brain-hormone activity and increasing phosphoinositide (needed for cell and calcium activation) breakdown (Fluoride, 1996; 29: 187–8). In guinea pigs—which, like primates, including humans, cannot synthesise their own vitamin C—intracellular fluoride alters calcium currents from neurons in the hippocampus (J Neurosci, 1986; 6: 2915–20).

The fluoride ion also affects amide binding such as seen in proteins. This may explain how fluoride is able to disrupt key sites in biological systems (J Am Chem Soc, 1981; 103: 24–8; Int Clin Psychopharmacol, 1994; 9: 79–82).

Another study found that fluoride binding induced significant disorders in the structure of the cytochrome C peroxidase enzyme (Chem Eng News, 1988; Aug 1: 26–42). Indeed, over 100 enzymes are affected by fluoride binding to enzyme cofactors such as magnesium, manganese and phosphate, thus preventing the appropriate coenzyme from activating its enzyme (Lee L. *The Enzyme Cure*. Tiburon, CA: Future Medicine Publishing, 1998: 211).

Fluoride from any type of exposure destroys 66 of the 83 known enzymes (Judd GF. *Good Teeth Birth to Death*. Glendale, AR: Research Publications, 1997: 19, 53). Fluoride attacks enzymes at their weakest links—the hydrogen bonds surrounding the active site. For every enzyme inhibited or destroyed, a major metabolic function is stopped, as they are required in every bodily process.

Prenatal exposure

The human nervous system develops throughout gestation and in the early postnatal period; higher cognitive functions develop toward the end of gestation—when brain nerve cells become differentiated and brain development is particularly rapid—and soon after delivery. Slowly and with some difficulty, fluoride penetrates the fetal blood–brain barrier (Fluoride, 1986; 19: 108–12; Chin J Epidemiol, 1993; 2: 97–8) to accumulate in brain tissue (Chin J Control Epidem Dis, 1989; 4: 136–7).

The draconian Chinese one-child-per-family rule has provided us with more evidence of the deadly effects of fluoride on the developing fetal brain. China has persisted with abortions in families who already have one child. In those areas with elevated fluoride and fluorosis due to coal-burning, fluoride has been found in the brain tissue obtained from aborted embryos. Stereological and ultramicroscopy studies of this developing brain tissue show poor differentiation of brain nerve cells and delayed brain development (J Fluoros Res Commun, 1991; 138 [in Chinese]).

One of the dangers of fluoride is that this damage to a developing fetus occurs at levels far lower that those considered dangerous to adults. Fluoride effects on intelligence *in utero* can be seen at levels that are not toxic to the mother. In one study, fluoride concentration was higher in a typical mother's placenta than in her own blood (Gedalia *et al.*, 1961; Abstracts from *USPHS Toxicological Profile on Fluorides*). But, as umbilical cord levels do not accurately reflect fetal fluoride status, this suggests that the placenta is somehow isolating the fluoride as a form of innate protection (J Perinat Med, 1995; 23: 279–82).

Nevertheless, eventually, enough fluoride will cross the placenta and reduce the available fluoride-binding sites in the newborn (Pediatrics, 1975; 55: 517–22).

In 1991, the US Public Health Service (USPHS) reported that millions of women in 'optimally' fluoridated cities ingest from all sources—and expose their embryos and fetuses to—as much as 6.6 mg of fluoride per day (USPHS. *Review of Fluoride Benefits and Risks*, 1991). While the women themselves may not have symptoms or problems, such levels could be deadly to the brain of their developing babies.

Damage as adults

Do IQs drop still lower if high exposure to fluoride continues? Studies do not answer this directly, but there is evidence that continued exposure does worsen mental problems.

High fluoride exposure does appear to weaken mental function in a dose-related manner in adults as well as in children. Declassified 1944 documents show that the year before USPHS epidemiological 'testing' of fluoridation was to start in Grand Rapids, Michigan, and Newburgh,

New York, the military/industrial complex had already acquired evidence that fluorides affect memory and cognitive skills.

The Manhattan Uranium Project concluded: "Clinical evidence suggests . . . mental confusion, drowsiness and lassitude as the conspicuous features. It seems most likely that the fluoride component is the causative factor" (US Medical Corps document, 4/29/44). Much of the evidence of adverse fluoride effects was censored out of the document, and later, related documents are now either 'missing' or have been made to disappear by the US government (Griffiths J, Bryson C. Fluoride, teeth and the atomic bomb. Waste Not, 1997; Sept: 1–8).

Researcher Dr Bruce Spittle has cited examples of fluoride affecting adult mental function (Int Clin Psychopharmacol J, 1994; 9: 79–82). As he concluded: "The late George L. Waldbott, MD, in 1979 studied 23 persons living within three miles of an enamel factory that emitted hydrogen fluoride into the air. Symptoms included a distinct decline in mental acuity, poorer memory, inability to coordinate thoughts and reduced ability to write. Those living further away from the factory were less affected and had lower urinary fluoride" (Vet Hum Toxicol, 1979; 21: 4–8).

In 1981, after a fluoride overfeed to the water of the city of Annapolis, Maryland, Waldbott wrote: "Six [out of 112 who suffered ill effects] reported deterioration of their mental acuity, lethargy, loss of memory . . ." (Clin Toxicol, 1981; 18: 537–49).

In another study of 60 aluminium smelter workers, 97 per cent had skeletal fluorosis and 22 per cent had psychiatric disturbances, including depression, mental sluggishness and forgetfulness (Fluoride, 1977; 10: 12–6).

In other studies by Waldbott and his colleagues, psychiatric symptoms such as lethargy, memory impairment, and difficulties with concentration and thinking began after fluoride exposure. This was usually due to fluoridated drinking water, although three cases involved industrial exposure.

Dr Spittle concluded, "There is suggestive rather than definitive evidence that chronic toxicity affecting cerebral functioning can follow exposure to fluoride" (Int Clin Psychopharmacol J, 1994; 9: 79–82).

In light of the findings in China, however, the conclusions are moving towards certainty, and fluoride damage to intelligence may be

worse in the UK and US than in China. Millions of embryos and infants receive daily fluoride at doses known to cause crippling skeletal fluorosis in adults (USPHS, Review of Fluoride Benefits and Risks, 1991).

Furthermore, fluoride intake may increase two- to fourfold or more during hard physical work in a hot climate, and even more if the water used for cooking and in beverages is also fluoridated. About 3 per cent of Americans drink at least four litres of water a day, and more where the climate is hotter.

Boiling water evaporates the chlorine while concentrating fluoride. If the water contains 4 ppm of fluoride, a person may ingest 16 mg of fluoride a day or more, in addition to the fluoride from other sources such as toothpaste, food and air—enough to produce crippling skeletal fluorosis within a few years.

China is sensibly protecting the intelligence of its unborn children by defluoridating its water supply (J Orthomolec Med, 1993; 8: 149–53). We can all learn from their example.

11
Other Causes of Dental Decay

The biggest risk factors for death due to heart disease at the beginning of the 20th century were tooth and jaw infections. A single unhealthy tooth could lead to an early grave as a result of subacute bacterial endocarditis, cavernous sinus thrombosis and brain abscesses.

Now, 100 years later, what is one of the strongest predictors of death due to heart disease? Teeth—or, more exactly, gum disease. This one risk factor is just as important as smoking, obesity, blood pressure or an unfortunate family history in determining whether we will die before we should (Ann Periodontol, 1998; 3: 127–41).

Why is what goes on in your mouth so dangerous? Teeth sockets are a royal highway for disease pathogens, leading them straight to your bones and bloodstream. A tooth abscess is a kind of osteomyelitis, or bacterial bone infection. The bacteria quickly migrate to other parts of the body to cause pockets of infection.

The situation is not helped by dental techniques such as crowns. These devices may make teeth appear more attractive on the outside but, often, those metal or plastic caps do nothing more than disguise a pocket of purulent infection that can explode when immune function is compromised.

The late Patrick Stortebecker, professor of neurology at the Karolinska Institute in Stockholm, Sweden, carried out a series of experiments in the 1960s which are both highly illuminating and rather scary. He injected the bone margins of teeth with radiopaque dyes, then X-rayed the skull.

As most veins in the head don't have control valves, blood is able to travel both forwards and backwards. The radiopaque dye thus appeared all over the head, in each case, far from the initially injected tooth (Stortebecker P. *Dental Caries as a Cause of Nervous Disorders*. Orlando, FL: Bio-Probe Inc, 1986: 34).

This indicates that, if a given tooth were infected, the results could be very adverse indeed. Bacterial toxic matter could be propelled up into the cranium and set up an infection inside the skull.

Stortebecker himself mentioned the risk of cavernous sinus thrombosis (blood clots) and suppuration (pus). If the cavernous sinus (a large venous reservoir at the base of the brain) should become clotted and filled with pus, then widespread meningitis and brain abscesses would be inevitable.

Stortebecker found another disease model that is very persuasive. He considered that what he found was the principal factor in the development of multiple sclerosis. Through extensive research, he was able to show that most plaques of nerve demyelination (when the protective myelin sheath surrounding nerves are stripped away, an unmistakable sign of MS) were located close to blood vessels (Stortebecker P. *Dental Caries as a Cause of Nervous Disorders*. Orlando, FL: Bio-Probe Inc, 1986: 116).

No one had made this important observation before. Stortebecker speculated that the back-pressure on veins shunted toxic matter into the brain, causing a focus of inflammation and loss of myelin. What was particularly convincing was that the MS cases with optic neuritis (neural inflammation leading to blindness) also generally had bad teeth and inflammatory plaques in the brain, whereas those with leg weakness or paralysis and demyelination plaques in the spinal cord had pelvic or other lower-body pockets of disease.

Sadly, Stortebecker is gone now and, apart from a handful of us, his work is completely ignored. It has not been possible to interest anyone in the medical establishment to carry out more studies in this area. Dentists don't want to even think about it. Doctors say it's a dental problem and nothing to do with them—yet another sorry example of how specialisation has made medicine both foolish and ineffectual.

The problems of infection are not helped by modern dental methods. Research by Ralph Turk and Fritz Kronner in Germany has shown that even the act of drilling a tooth causes severe energy disturbance (Turk R. *Iatrogenic Damage Due to High-Speed Drilling*. Presentation in the Scientific Session at the dedication of the Princeton Bio Center, New Jersey, 13 June 1981).

Turk describes the modern dental turbine rotor as a sort of time bomb

and claims that its damaging intensity has been completely missed by the vast majority of dentists. There are many likely reasons, not least of which is the fact that, despite water-cooling, the temperature in the tooth rises by as much as 10 degrees with just a few seconds of drilling.

In biological terms, the tooth has been 'cooked'. This denaturation clearly damages the tooth and its ability to resist bacterial invasion. From more than 6000 cases studied, it was uniformly seen that, as soon as a tooth was visited by a high-speed drill, focal bone infection began to develop in connection with that tooth within two years.

Most dentistry is, by nature, toxic. Modern methods rely heavily on materials such as metals, plastics and polymers, ceramics and prosthetics of all sorts. Most of this foreign material is stressful to the body and a considerable drain on the immune system—and therefore a major contributing cause of fatigue and chronic ill health.

Given what we now know about allergies, we can only urge people to try to prevent dental problems in the first place. A good diet and adequate dental hygiene may still be, even in this era of antibiotics, a lifesaver.

As for drilling, it is possible to reduce the damage by taking sensible antitoxic procedures before, during and after a dental programme. Such elementary measures would include vitamin C, charcoal (to absorb toxins), and homeopathic support and immune drainage compounds that can provoke a speedier removal of toxins. Any good homeopath or herbalist will be familiar with drainage techniques and be able to offer a treatment of choice.

12
Protective Tooth Care

Given the risks of conventional dental procedures, prevention makes a lot of sense. There is a number of natural strategies that can help keep your teeth and gums healthy. Try each of these 'treatments' for at least two months before deciding if they work or not.

- **Eat whole, unprocessed foods**. Several dietary factors have been implicated in tooth decay. Most of them—refined flours, inactivation of vitamins by processing and heating, and high sugar levels—are due to highly processed foods. In contrast, fresh foods contain many of the nutritional elements necessary to maintain good oral health.
- **Use an alcohol-free mouthwash**, as alcohol dries the mouth, thereby allowing invasive bacteria to take hold. Mouthwashes containing folic acid (0.1 per cent) can combat bleeding gums, and 4 mg/day of folic acid in capsule or tablet form may also be effective (J Periodontol, 1976; 47: 667–8). Mouthwashes containing herbal extracts such as chamomile, *Echinacea* and myrrh may be particularly effective.
- **Avoid environmental toxins**. Finnish researchers found that dioxin exposure via breastmilk and food can result in chalky lesions on the teeth and loss of enamel in children (Lancet, 1999; 353: 206–7). Lead is similarly damaging (Nat Med, 1997; 9: 1024–5).
- **Minimise your drug-taking regime**, as drugs can affect your oral health. Antidepressants reduce saliva levels, which can lead to tooth decay in adults (Lancet, 1995; 346: 1640). Lowering the dose, chewing sugar-free gum or taking extra vitamin C can help. The birth-control pill can lead to an increased risk of gum disease by encouraging bacterial growth in the mouth (Contraception, 1998; 57: 381–4).
- **Consume green and black teas**, which both contain flavonoids that inhibit the growth and activity of the bacteria associated with tooth decay (Arch Pharm Res, 1998; 21: 348–52). Tea also contains natural fluoride, which may be helpful.

- **If you must eat sweets, use sugar substitutes such as sorbitol and xylitol**, which appear to have anticaries benefits (Am J Dent, 1996; 9: 184–90). Of the two, xylitol-containing chewing gum appears to be more beneficial than sorbitol-containing gum, which can cause flatulence.
- **Replace your toothbrush regularly**—at least every month. Worn toothbrush heads are less efficient at removing food and plaque, and can lead to tooth decay and gingivitis (gum inflammation).
- **Improve your tooth-brushing technique**. Brush every day, ideally after each meal, using five to 10 strokes in all areas—downwards on the upper teeth, upwards on the bottom ones, and circular across the upper surfaces of the back teeth.
- **Supplement with a good-quality multivitamin/mineral**. This will make up for any dietary deficiencies and provide useful amounts of nutrients, such as zinc and selenium, necessary to maintain a vigorous immune system that can help fight off dental bacteria.

In addition, take:

- **Coenzyme Q10** (50 mg/day) to avoid bleeding gums (Res Commun Chem Pathol Pharmacol, 1976; 14: 715–9).
- **Vitamin C**, as a deficiency can increase your risk of gum disease. Taking just 70 mg/day can quickly improve the health of your gums (Int J Vitam Nutr Res, 1982; 52: 333–41)—but only in those who are deficient in this vitamin.
- **B-complex vitamins**, which help make body tissue stronger. Vitamin B_6, in particular, has long been known to encourage beneficial mouth bacteria while decreasing those that cause decay (NY State Dent J, 1959; 25: 303–7). Aim for 10–20 mg/day.

Even if your drinking water isn't fluoridated (and much of the UK's isn't), fluoride resides in all sorts of unlikely places. Indeed, the concentration in outer enamel of the teeth of children aged six to 10 can sometimes reaches 10,000 ppm (parts per million) (Fluoride, 1986; 19: 147–8). In the US, the Centers for Disease Control (CDC) is calling for manufacturers to list a product's fluoride content (*Wall Street Journal*, 21 December 1998, p B1).

Here's how to avoid the hidden sources:

- **Send your child to school with bottled water**. Schools can add additional fluoride to their drinking water. In the US, in addition to water fluoridated to about 1 ppm, many schools have levels of 5 ppm (Fluoride, 1994; 27: 32–6).
- **Avoid medicine whenever possible.** Fluoride is contained in many over-the-counter and prescribed medicines, such as Prozac and vaccines.
- **Choose dental products with care**. Fluoride is included in most commercial toothpastes and dental-hygiene products, including dental floss. Exceptions include brands such as Kingfisher, Green People, Weleda, Neways and others found on healthfood-shop shelves. Always read the label before buying.
- **Eat organically to avoid fluoride from pesticides and fertilisers**.
- **Keep your child away from constant exposure to heavy traffic**. Fluoride is present in engine solvents, fuels and auto exhausts.
- **Check food labels**. Fast foods and even 'health foods' can contain fluoride (Fluoride, 1986; 19: 152–3).
- **Have your child play near grass and trees**. Some 155,000 tons of fluoride are released annually into the air and circulated around the world by the wind. Airborne sulphur dioxide worsens fluoride-related problems (Fluoride, 1996; 29: 7–12). We even inhale it in air that is humidified with fluoridated water.
- **Eat organic fish**. Some 500,000 tons of fluoride a year runs into fresh waters and the sea, and about 143,000 tons are pumped yearly into drinking water supplies (Earth Island J, 1998; Spring: 38–41).
- **Don't let your child live on canned beverages**. Western teenagers now drink twice as much soda as milk, a reverse of figures noted 20 years ago. Many young men between 13 and 18 years of age drink three or more cans a day, and 10 per cent drink seven or more cans a day. Among 13- to 18-year-old girls, the average intake is more than two cans a day, with 10 per cent guzzling more than five cans a day (Center for Science in the Public Interest, 1998).

  A typical soft drink contains 200–300 mg of phosphate to act as a buffer to prevent the acidity of the drink from dissolving the teeth. But phosphates and sulphates in food and soft drinks increase the

absorption of fluorides (Stookey GK *et al.* 1964; Abstracts from the *US Public Health Service Toxicological Profile on Fluorides*).

Ordinarily, aluminium cannot penetrate the blood–brain barrier. However, fluoridated water is an excellent medium for allowing aluminium to pass into the brain, making the aluminium more bioavailable (Casdorph HR, Walker, M. *Toxic Metal Syndrome*. New York: Avery Publishing Group, 1995: xiv). Also, after six months of storage in aluminium cans, the concentration of aluminium in the drink may reach 6000 ppm (aCRES-usa, 1996; April).

- **Avoid non-organic store-bought fruit juices and non-organic fruit.** In one study, 43 ready-to-drink fruit juices and frozen concentrates reconstituted with distilled water were tested for fluoride ion concentration; 42 per cent were found to contain more than 1 ppm (J Am Dent Assoc, 1996; 127: 895–902). 'Pure' grape juices contained up to 6.8 ppm, probably due to contamination by the insecticide cryolite. Just washing grapes before eating yields measurable amounts of fluoride (J Clin Pediatr Dent, 1991; 16: 38–40). Fluoride makes fruit juice particularly corrosive and, if there is too much fluoride, it can destroy enamel on teeth, reports the Academy of General Dentistry (J Clin Pediatr Dent, 1991; 16: 38–40).
- **Breastfeed your baby as long as possible and be wary of formula**. In 1979, formula manufacturers reduced fluoride in their products to a 'low' level. But years later, one researcher reported a 2.8-fold increase in the risk of fluorosis associated with stopping breastfeeding early (Caries Res, 1993; 27: 71–7). The mother's body appears to filter out some of the fluoride before it gets into the breastmilk. Another team of scientists reported a 3.3-fold increase in fluorosis risk with infant formula, and a sevenfold increase in risk with soy-based infant formula (Am J Epidemiol, 1994; 140: 451–71).

Minimising your fluoride exposure

Although you can't eliminate your exposure to fluoride entirely, you can minimise your risk of an overdose. To help avoid fluoride toxicity:

- **Eat foods low in fluoride**, such as milk, eggs, red meats (not organs), produce with a protective rind (watermelon, lemon, banana, coconut),

fruits packed in their own juices (pineapple) and those canned in non- or low-fluoridated countries
- **Take adequate amounts of vitamins B_6 and C**
- **Supplement with calcium and magnesium salts** to help decrease fluoride absorption from the stomach and assist in elimination
- **Maintain good general and dental health** by regularly eating a variety of vegetables (lightly cooked or raw), fresh fruits, pulses and little sugar
- **For dental health, maintain adequate levels of calcium and phosphorus** as well as magnesium, strontium, molybdenum, vanadium and zinc (Waldbott GL *et al. Fluoridation: The Great Dilemma*. Lawrence, KS, Coronado Press, 1978)
- **If possible, avoid moving to areas that have fluoridated water supplies** which, in the UK, include much of Birmingham, Newcastle, all of Warwickshire, parts of Carlisle, Coventry, Doncaster, Derbyshire, Lincolnshire, Wolverhampton and isolated areas elsewhere
- ***Avoid the following drugs* which contain fluoride**: Prozac (fluoxetine), Rohypnol (flunitrazepam), Diflucan (fluconazole), Flixonase or Flixotide (fluticasone), Stelazine (trifluoperazine), Fluanxol or Depixol (flupenthixol) or Floxapen (flucloxacillin)
- **Contact your local water authority for analysis figures of your water supply's fluoride content** or, for more information, the National Pure Water Association at: 42 Huntington Road, York, YO31 8RE (tel: 0208 220 9168; website: www.npwa.org.uk)
- **Use fluoride-free toothpaste,** such as Tom's, Tea Tree, Sarakan, Kingfisher, Natural Propolis, Weleda and Aloedent, available from health-food shops
- **Install a water-purification system that removes fluoride.** Contact:
  - Ecowater, Mill Road, Stokenchurch, High Wycombe, Bucks HP14 3TP (tel: 01494 484 000; website: www.ecowater.co.uk)
  - The Fresh Water Filter Company, Unit 3 Old Winery Business Park, Chapel Street, Norwich, Norfolk, NR10 4FE (tel: 0845 177 0896; website: www.freshwaterfilter.com)
  - Crouch Water Softener Services, 631 London Road, Westcliffe-on-Sea, Essex SSO 9PE (tel: 01702 392 828).

13
Holistic Dentistry

A woman goes to the dentist and says, "I've got a terrible toothache." The dentist takes one look at the tooth and says, "There's nothing wrong with that tooth. You need to get your intestines cleaned out." The woman undergoes colonic irrigation and the pain in the tooth disappears.

Another patient who's pulled a hamstring muscle goes to see his dentist for a check-up. The dentist makes a quick realignment of one of his teeth, and his hamstring problem is cured.

These seemingly fantastical cases are just two selected from the patient files of David Hefferon, one of a handful of holistic dentists in Britain.

In itself, holistic medicine is not of new, of course, but it has taken years to arrive in the relatively staid world of the dental profession.

Nevertheless, holistic dentistry is now one of the fastest-growing branches of medicine. It has taken off in the US (where it's called 'biological dentistry'), and there is a growing band of practitioners in Europe.

Of all the medical specialities, dentistry has always been the one most set apart from the rest of doctoring. Practitioners have considered teeth to have, at most, a tangential connection to health in the rest of the body. This is an attitude that dentists themselves have reinforced. In Britain, for example, they have divorced themselves from the rest of the National Health Service (NHS).

But evidence is mounting that teeth are an integral part of health, with links to diseases in other parts of the body. For example, gum disease can almost double your risk of a heart attack, and low levels of vitamin B_6 can cause tooth decay—two facts that your ordinary dentist is unlikely to have ever mentioned to you.

"Nutrition is just one of the tools I use," says Hefferon. "I also look at the patient structurally, energetically and chemically.'

Central to Hefferon's approach is a multidisciplinary set-up. Under the same roof as his high-tech dental surgery, he has gathered together a team of alternative therapists—a cranial osteopath, a herbalist, a nutritionist and a physiotherapist who specialises in energy medicine. "We each have our area of expertise, and there's lots of inter-referring," he says. "For example, if something I'm doing in the mouth isn't working, I can get advice on what the underlying problems may be—and have them sorted out on the spot."

The importance of bite

One of the guiding principles of holistic dentistry is the importance of the 'perfect bite'. If the top and bottom teeth don't mesh correctly, this can set up stresses in the jaw. We open and close our jaws about 2000 times every day, so a bad bite will lead to chronic muscle stress. There are ligaments that connect the teeth to the jawbone, and these have stretch receptors that are constantly trying to readjust the jaw muscles to ease the stress on the teeth. This, in turn, creates spasms in the muscles surrounding the joint that connects the jaws to the skull—the so-called temporomandibular joint (TMJ).

Learning about the TMJ is essential for any holistic dentist because the jaw joint is linked to virtually every part of the body. The importance of the TMJ was first discovered by chiropractors and osteopaths, who called it 'the great impostor' after they discovered that TMJ dysfunction can be linked to a whole raft of problems that have no obvious connection to the jawbone. These include postural and spinal problems, arthritis, headaches, and leg, neck or shoulder pain (J Am Dent Assoc, 1987; 115: 251–6; Minerva Stomatol, 2002; 51: 167–71; Acta Med Austr, 2004; 31: 18–22).

David Hefferon's hamstring patient is a case in point. He was a football player who suffered recurrent hamstring injuries. At first, he went to an osteopath, who recognised that the problem was coming from the lower back; the back was treated and the problem went away—but only for a while. It was when he went for a routine dental checkup with Hefferon that the real cause of the muscle problem came to light.

Hefferon saw that the man's TMJ was misaligned due to a poor bite. "This had obviously been a long-term problem," says Hefferon. "His TMJ was out of true, and his body unconsciously tried to compensate—in his case, by permanently making the jaw jut out. This bent the spine, pushing the pelvis forward, upsetting the normal running position. This put undue strain on the legs, causing the chronic hamstring problem."

Hefferon fixed the TMJ, and the hamstring problem has never recurred.

A similar case comes from American holistic dentist Dan Gole, of Michigan. One day, Gole was doing a TMJ-related tooth adjustment on a patient. When it was all done, he asked the patient how he felt. "The tooth is fine," said the patient, "but what's interesting is that the pain I've had in my foot for a couple of weeks has completely stopped."

New York dentist Frederick Milton specialises in using holistic dentistry to relieve chronic physical pain. Often, he finds that it's due to shoddy work done by other dentists. "Every time you swallow, your teeth touch and your body gets a neuromuscular reading off your teeth," says Milton. "If your teeth are maloccluding—for example, because of too prominent a filling or a crown—your body quickly readjusts. You won't be aware of this, but the readjustment will be chronic; this can sometimes result in chronic pain elsewhere in the body. And you will have no memory of how it started."

David Hefferon goes further: "The TMJ is the headquarters of the body's balance mechanism, and if the jaw doesn't close properly because of maloccluded teeth, the balance mechanism is forced to adapt. However, because it's under constant stress, the brain is pumping out lots of noradrenaline [norepinephrine] and serotonin. This sensitises the autonomic nervous system, making the patient vulnerable to any other stressors like bad diet or emotional problems. So depression, for example, could be linked to TMJ dysfunction."

Hefferon says 95 per cent of his patients have TMJ problems due to maloccluding jaws, but admits that he may be seeing a biased sample of people. "Most of my patients are rejects from other dentists, so I'm bound to get problem cases," he says.

Nevertheless, US dental expert James E. Carlson concurs with Hefferon's figure. "Ninety per cent of people have a problem with malocclusion," he says in a 500-page report on TMJ problems (*Orthocranial Occlusion and the Accu-Liner System*. Blue Pine Unlimited, 2000). "This may be because most people have underdeveloped jaws—probably due to diet."

It was in the 1930s that US dentist Dr Weston Price first proposed the theory that the lack of chewing required by modern eating habits has resulted in smaller lower jaws and 'deformed arches' (the palates that connect the teeth) compared with our Neanderthal ancestors. This was Price's explanation for why overcrowding of the teeth is now so common in children. Price's theory sparked a huge debate that is still raging today.

Big teeth or small jaws

The controversy over overcrowded teeth is focused on two main questions: why do they happen, and what should dentists do about them?

The prevailing theory is that overcrowded teeth are caused by a genetic error in the womb, where the developing child inherits its jaw from one parent and its teeth from the other. This leads to a potential mismatch, with the big teeth of one parent not fitting into the jaw of the other.

But not everyone agrees with this scenario. "The 'Daddy's teeth, Mummy's jaws' theory is not universally shared," says Hefferon. "The opposing theory says overcrowded teeth are the right size; it's just that we have inherited a smaller jaw because of thousands of years of evolution responding to a diet that doesn't require much chewing."

As far as solving the overcrowded teeth problem, for most dentists, the answer is obvious: remove a few teeth to give the rest of them enough room—in other words, make the teeth fit the jaw. But a growing minority of dentists are saying: "These are perfectly healthy teeth, so why extract them?" Instead, they suggest making the jaw fit the teeth by expanding the jaw to accommodate them. This solves the problem by addressing its root cause—an undersized jaw.

This extraction/expansion debate is a huge issue within dentistry, with hotly argued positions on each side. Holistic dentists tend to favour

the expansion approach because they believe that extraction can often upset TMJ balance. This may then lead to a host of spine-related problems such as poor posture, wrong breathing and back pain. However, partly because this is such a new field of study, the evidence is still mostly anecdotal (Orthod Fr, 1992; 63 Pt 2: 443–53).

Australian dentist Joseph da Cruz is another holistic dentist with a growing international reputation (to contact him, see: www.wholistic-dentistry.com.au). He has developed a simple jaw-expansion device that is claimed to be a major advance on the usual 'functional appliances' as it requires fewer fixings to the teeth, making it considerably easier to wear. "It avoids or minimises the need for tooth braces, thus helping the flow of cerebral fluid in the spine," he says.

Although it's mostly children who are treated for overcrowded teeth, adults can benefit from jaw expansion, too. One of David Hefferon's cases was a 60-year-old businessman with such chronic backache that he could no longer travel. A small expanding device on the lower jaw stopped the backache—and the man is now happily flying all over the world.

Unlike conventional braces, jaw-expansion devices work incredibly quickly. Joseph da Cruz has before-and-after photos showing remarkable changes after as little as three months, including a noticeably more attractive facial appearance.

Holistic dentists also deal with cavitations—holes in the jaw, often at the site of an old extraction, such as a wisdom tooth, or under a root-canal filling—which can occasionally affect the entire jaw. Cavitations can lead to facial pain, headache and neuralgia, and phantom-tooth pain. The treatment is to clean them out and encourage bone to grow back through nutritional support.

A complementary programme

But the real promise of holistic dentistry is that it offers an entirely new way of looking at the connection between teeth and general health. In doing so, it is exploring how alternative medicine can be brought into the dental surgery—with astounding results.

Take acupuncture, for example. Years ago, this was only thought

useful for pain relief—teeth have been extracted with nothing but acupuncture analgesia. But the benefits of acupuncture are far subtler than that; it is now believed that every tooth is linked energetically with different organs in the body via the acupuncture meridians.

This knowledge could turn conventional dentistry on its head. In the case of the patient with toothache cured by a colonic, he had suffered acute pain for weeks and arrived begging to have the tooth removed. But Hefferon could see nothing wrong with the tooth. "I knew that acupuncture theory says this particular tooth is connected to the colon, so it didn't take more than a few questions to discover this man had an intestinal problem," he recalls. "I advised him to get his colon irrigated, and the tooth pain vanished."

Hefferon takes things even further by using colour therapy. "If the patient needs calming or if I'm working on a tooth connected to the kidney, I will give him blue protective glasses to wear," he says.

Hefferon also uses his knowledge of the martial arts to teach his patients *qi gong* breathing techniques. "Poor breathing causes acidity in the body which impairs mercury detoxification," he says.

Indeed, in moving on from being oral carpenters, holistic dentists offer a model for medicine as a whole.

12
Dentists

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To request lists of mercury free/holistic dentists, contact:

The British Homeopathic Dental Association
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www.bhda.co.uk

British Society for Mercury-Free Dentistry
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