

Water fluoridation

helps protect teeth throughout life



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Message from the Chief Health Officer of Victoria

Tooth decay is a disease which affects both children and adults, and can cause considerable pain and suffering. When severe, tooth decay can affect appearance, self-esteem and social interaction, and it can also make it difficult to speak and chew. Treating tooth decay can be costly, in terms of time and money, and sometimes children may need a general anaesthetic to have their decay treated.

Water fluoridation helps protect teeth against decay, and is the most effective way of allowing everybody access to the benefits of fluoride.

Scientific studies have shown that water fluoridation is a safe and effective way to reduce tooth decay, even though there is widespread use of fluoridated toothpaste. In Victoria, children living in fluoridated areas experience considerably less tooth decay than those in non-fluoridated areas.

About three quarters of Victorians drink water with either naturally occurring or added fluoride—most of these people live in metropolitan Melbourne. Water fluoridation is an effective, inexpensive and socially equal way to reduce tooth decay in children and adults.



Robert Hall

Dr Robert Hall
Chief Health Officer, Victoria

Water fluoridation: quick facts

- Water fluoridation helps protect teeth against decay in people of all ages, from very young children to the elderly.
- By preventing tooth decay, water fluoridation saves individuals and families money on dental treatment. It also means less time away from school and work because of tooth pain and dental treatment.
- Most Australians have had water fluoridation for 25–50 years.
- You cannot taste or smell fluoride in your water.
- Water fluoridation is a safe way to protect teeth against decay, and is supported by leading national and international health organisations.
- The overall weight of scientific evidence does *not* link water fluoridation with side effects such as cancer, bone fractures, Alzheimer’s disease or allergy.
- Mottling of teeth can occur if young children get too much fluoride (dental fluorosis). It is generally barely noticeable, and also occurs in areas without water fluoridation. By using fluoridated toothpaste carefully, and only using fluoride tablets if prescribed by a dentist, the chances of dental fluorosis can be reduced without denying anybody the benefits of water fluoridation.
- The amount of fluoride added to the water is carefully controlled and monitored.
- Water fluoridation is the most effective way to give everybody access to the benefits of fluoride regardless of age, income or education level.



Water fluoridation status in Victorian population centres greater than 5,000 people, 2002

(Map prepared by GISCA, Adelaide University, May 2002.)



Water fluoridation helps protect teeth throughout life

- Fluoride occurs naturally in water, plants, rocks, soil, air and most foods.
- Water fluoridation is the adjustment of fluoride in drinking water to a level that helps protect teeth against decay.
- Water fluoridation helps protect teeth against decay.
 - Tooth decay occurs when acid destroys the outer surface of the tooth. The acid is produced from sugar by bacteria in the mouth. Fluoride can limit the amount of acid produced, and more importantly can also repair damage before it becomes permanent. A constant supply of low levels of fluoride in the mouth is best for this—fluoride in your water supply acts like a constant ‘repair kit’ for teeth.



Everybody benefits from water fluoridation

- Water fluoridation is the most effective way to give everybody access to the benefits of fluoride regardless of age, income or education level.
- Water fluoridation helps protect teeth against decay in people of all ages, from very young children to the elderly.
- Six year old children living in fluoridated areas of Victoria experience 45 per cent less decay in their **baby** teeth than those in non-fluoridated areas.
- Twelve year old children living in fluoridated areas of Victoria experience 38 per cent less decay in their **adult** teeth than those in non-fluoridated areas.
- Studies have shown that adults benefit from water fluoridation too. This effect is in *addition* to the benefits you get from drinking fluoridated water as a child.
- By preventing tooth decay, water fluoridation saves individuals and families money on dental treatment.
- Water fluoridation results in less time away from school and work because of tooth pain and dental treatment.
- Over 25 years, water fluoridation saved the Victorian community about \$1 billion, through avoided dental costs and lost productivity, and saved leisure time.



Baby and adult teeth both need protection against decay

- Some people think that baby teeth are not important, because children will lose them anyway. It is important to look after baby teeth because:
 - Even though children lose their first teeth, decay can be painful and expensive to treat. Baby teeth are not normally completely shed until about 10–12 years of age, so it is important to look after them for general health and wellbeing.
 - Baby teeth have thinner enamel (the outer coating) than adult teeth, and decay can more easily get to the middle of the tooth. This can be extremely painful, keeping the child awake at night and sometimes is not relieved by painkillers. If not treated it can lead to a painful dental abscess (collection of pus) and a swollen face. A dental abscess can cause permanent damage to the adult tooth developing underneath.
 - Baby teeth guide the adult teeth (which develop underneath) into position. If the baby teeth are lost too early, for example being pulled out because of decay, the space may close up due to movement of nearby teeth—this may require orthodontic treatment later on.
- It is also important to look after adult teeth. When people get older the gums tend to recede which exposes more of the root of the tooth. Unlike the rest of the tooth, the root is not covered by enamel and is more susceptible to decay, which can be painful and difficult to treat. Water fluoridation is known to help protect against root surface decay in older people.



Other ways to protect your teeth

- Even if your drinking water is fluoridated, it is still important to look after your teeth through healthy eating, regular brushing, appropriate use of fluoridated toothpaste and regular dental check-ups.
- Brushing with fluoridated toothpaste is a good way to help protect your teeth against decay and is recommended for everybody over the age of two. Use a low-fluoride toothpaste for children under six years. Water fluoridation gives extra protection against decay even if you already brush your teeth with fluoridated toothpaste.
- Fluoride tablets do not give much (if any) extra protection, and increase the risk of dental fluorosis (mottled teeth). Fluoride tablets should only be used if prescribed by a dentist, even if you do not have water fluoridation.



Water fluoridation will not change the taste or smell of your water

- Fluoride has no taste or smell, so water fluoridation will not change the taste or smell of your drinking water. Your local water authority will be able to confirm if your water has fluoride in it.
- Melbourne received the gold medal award in 2003 for the best-tasting drinking water in Australia. The silver medal went to Darwin and the bronze medal to Hobart. All of these cities have water fluoridation.
- Some people choose to boil their drinking water. Boiling water will not significantly change the amount of fluoride in it.
- With the exception of reverse osmosis filters, most home water filtering systems do not change the amount of fluoride in water.



Most Australians have fluoridated water

- Most Australians have had water fluoridation for 25–50 years. Every capital city in Australia, except Brisbane, has water fluoridation.
- About three quarters of Victorians have water with either naturally occurring or added fluoride—most of these people live in Melbourne.
- Towns such as Portland, Nhill and Kaniva have naturally occurring beneficial amounts of fluoride in the drinking water. It is added to the drinking water in Melbourne, and other towns including Bendigo, Kyneton, Echuca, Shepparton, Drouin and Maffra. Melbourne has had fluoridated drinking water for over 25 years.

See page 3 for a map of water fluoridation in Victoria.

Water fluoridation in other countries

- Other countries also have water fluoridation, including New Zealand, Hong Kong, Singapore, the United Kingdom, Ireland, Canada and the United States.
- Some people think that water fluoridation has been banned in Europe. In some countries water fluoridation is not practical because of very complex water systems without a central point to add fluoride. Some countries add fluoride to salt instead of water, which is then used in numerous products such as bread, to allow the community to benefit from fluoride.



Water fluoridation and your health

- Water fluoridation is a safe way to protect teeth against decay and is supported by many organisations worldwide including:
 - The World Health Organization
 - The Australian Dental Association
 - The Australian Medical Association
- Some people worry that water fluoridation may cause serious problems such as cancer, bone fractures, birth defects, Alzheimer’s disease or allergy. The safety of water fluoridation has been frequently re-evaluated, and the best evidence does not link water fluoridation with any of these.
 - There are many studies about water fluoridation. Any scientific study must be carefully reviewed to see if the results are likely to be accurate. A review is one way to consider the overall weight of evidence. One of the best reviews (National Health Service Centre for Reviews and Dissemination, 2000) looked at 214 of the highest quality studies to assess the benefits and possible side effects of water fluoridation. It found that water fluoridation protects against tooth decay without causing any unwanted effects apart from dental fluorosis in some people (see the next section). Other reviews also support the safety of water fluoridation.
 - In areas with extremely high levels of natural fluoride in the water, skeletal fluorosis (bone pain and joint stiffness) may occur, but no cases have ever been reported in Australia. In the United States only five cases have been reported, and these were in areas with natural fluoride four to eight times higher than the level used for water fluoridation programs.

Dental fluorosis

- Mottling of the teeth can occur if young children get too much fluoride (dental fluorosis). Fluoride tablets and full-strength fluoridated toothpaste are very high in fluoride, and add to the chance of dental fluorosis if used by young children. The amount of fluoride in full-strength toothpaste is about a thousand times higher than the amount in drinking water. For this reason, whether you have water fluoridation or not, it is important to:
 - Discourage children from swallowing toothpaste.
 - Brush children’s teeth without any toothpaste before the age of two, unless otherwise recommended by a dental professional.
 - Use only a pea-sized amount of low-fluoride children’s toothpaste for children between the ages of two and six.
 - Only use fluoride tablets if prescribed by a dentist.
- Most dental fluorosis that does occur is barely noticeable and appears as very fine pearly white lines or flecks on the teeth. It cannot develop after teeth are fully formed, and does not affect the function of teeth.
- Mottling of teeth is not always due to fluoride. Other causes include medications, injury to the teeth or childhood infections—if fluoride is not the cause, then it should not be called dental fluorosis.
- Dental fluorosis also occurs in areas without water fluoridation. This is why careful use of toothpaste and fluoride tablets described above is important for children in areas both with or without water fluoridation.
- By using fluoridated toothpaste carefully and only using fluoride tablets if prescribed by a dentist, it is possible to reduce the chances of dental fluorosis without denying anybody the benefits of water fluoridation.

Water fluoridation is safe

- Fluoride is added to the water at fluoridation plants especially designed to add carefully controlled amounts. The total amount of fluoride in the water is monitored regularly both at the fluoridation plant and at household taps.
- The National Health and Medical Research Council (NHMRC) is Australia's peak health organisation. To be acceptable to the NHMRC, a chemical added to drinking water must not be toxic at recommended maximum levels. For fluoridating drinking water, the NHMRC recommends sodium fluoride, sodium fluorosilicate and fluorosilicic acid. These fluoride compounds are added to water supplies in a controlled manner in amounts scientifically shown to prevent tooth decay.
- The fluoride added to water comes from natural rock. During the extraction process, a gas is produced. Gases are difficult to handle, so a piece of equipment called a scrubber can be used to convert the fluoride into a liquid or powder form which can be added to water supplies in a carefully controlled way. Scrubbers can also be used to reduce atmospheric pollution by gases, so some people think that because a scrubber is used, fluoride must be a poison. This is not true. Many substances we use every day are very beneficial in small amounts, but may be harmful in large amounts—examples include salt and even water itself. To help protect your teeth against decay, only very small amounts of fluoride are needed in the water (about 1 mg/L, which means that each part of fluoride is diluted in one million parts of water).
- The amount of fluoride added to your garden or farm from fluoridated water is very small—the amount of fluoride found naturally in rocks and soil is about 300 to 700 times higher than the amount added to water.



Opposition to water fluoridation

- Some people believe that it is not ethical to impose anything upon individuals who do not want it. For example, when compulsory wearing of seat belts was first proposed, some people complained that it was a restriction of their individual rights and freedoms. With time, the benefits of reduced injuries and deaths from motor vehicle crashes became clear.
- Water fluoridation has been endorsed by the United States Centers for Disease Control and Prevention as one of the ten greatest public health achievements of the 20th century. While it is acknowledged that there will always be some people who do not agree with water fluoridation, it is a safe and effective way to help protect teeth throughout life. Furthermore, it allows everybody to benefit, regardless of age, education or income levels.
- *“In considering the ethics of fluoridation... we should ask not are we entitled to impose fluoridation on unwilling people, but are the unwilling people entitled to impose the risks, damage and costs of failure to fluoridate on the community at large.”*

Professor John Harris, Centre for Social Ethics and Policy, University of Manchester 1998
(accessed from the British Fluoridation Society website, <http://www.bfsweb.org/ethics.html>).



Further information

The American Dental Association has published a booklet with answers to 42 questions about water fluoridation which includes over 200 scientific references. This booklet is available on the internet at <http://www.ada.org/public/topics/fluoride/facts/>

On the web

Department of Human Services

www.health.vic.gov.au/environment/water/fluoridation.htm

www.dhs.vic.gov.au/rrhacs/dentalhealth

Australian Dental Association

www.ada.org.au

Dental Health Services Victoria

www.dhsv.org.au

Better Health Channel

www.betterhealth.vic.gov.au

World Health Organization

www.who.int/water_sanitation_health/oralhealth/en/print.html

American Dental Association

(includes a 56-page booklet “Fluoridation Facts”)

www.ada.org/public/topics/fluoride/facts/

British Fluoridation Society

www.bfsweb.org



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