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Search: [#]

- [Home](/index.aspx)
- [Parents and Carers](/parents-and-carers/index.aspx)
- [Professionals](/professionals/index.aspx)
- [Contacts](/contacts/index.aspx)

Childsmile and fluoride varnish

The fluoride preventive measure that is used in Childsmile is the fluoride varnish, Duraphat®. It is the only fluoride varnish licensed for caries prevention in the UK at the moment.

Many scientific studies from around the world have shown that fluoride varnish is effective in reducing the decay rate in children when used in addition to brushing teeth regularly with fluoride toothpaste. A [Cochrane Systematic Review](http://www2.cochrane.org/reviews/en/ab002279.html) (external link) of 2008 confirmed the statistically significant caries-inhibiting effect of fluoride varnish.

Fluorosis

Fluoride varnish is a very safe material to use. However, if children ingest too much fluoride over a prolonged period of time, during the period when their teeth are developing, they can develop fluorosis in these teeth. In most cases, dental fluorosis appears as barely visible pearly white flecks or lines on the surface of corresponding teeth i.e. the signs of fluorosis are mirrored as a similar size shape and position on corresponding teeth (bilaterally symmetrical). There are more severe and unsightly forms of dental fluorosis but these are uncommon in the UK.

The Programme has been carefully designed to ensure that the possibility of a child developing fluorosis as a result of the Childsmile Programme is small and is balanced against the benefits of the prevention of decay.

About the application

The fluoride varnish application in the Childsmile programme will be offered twice a year in priority nurseries and schools from the age of three and in Childsmile Practice from the age of 2.

If the child receives fluoride varnish from their own dental practice as well as their

nursery/school, they will receive an additional benefit and their teeth will come to no harm.

The programme requires that all the dentists in the regions participating in Childsmile are informed of so that they are aware of the intervention.

Doses

Duraphat® will be prescribed for each individual child by a dentist. The correct dose for children with deciduous teeth (i.e. under 6 years old) is 0.25ml of Duraphat®. For children over 6 the recommended dose is 0.4ml.

Toxic doses

The toxic dose of fluoride ingestion is estimated at 5mg of fluoride per kg of child body weight (the average three year old weighs 11-20kg). The dose of 0.25ml of Duraphat® contains 5.6mg of fluoride – well within safe levels.

In the Childsmile programme only one dose should be available for a child at any one time. As only one dose is dispensed for each individual child and the remainder is locked away, there should be no opportunity for a child to ingest more than a single dispensed dose.

In dental practices, the appropriate dose of Duraphat® should be dispensed for the age of the child and the remainder should be put in a closed cupboard or drawer to which the child should have no access. In nursery and school, once dispensed, the remainder of the Duraphat® should be locked in the Childsmile trolley box or equivalent.

Acute fluoride toxicity in small amounts causes stomach irritation, nausea and vomiting. At very high amounts it can cause serious systemic toxic signs and symptoms including the possibility of death.

Fluoride is very quickly absorbed from the stomach. A child suspected of swallowing excessive levels of Duraphat® should be given a glass of milk to drink and then quickly transferred to the local A&E department for further assessment.

The fluoride varnish application relies on the topical action of fluoride, although inevitably a little of the varnish will be swallowed. Fluoride varnish will be offered in the Childsmile nursery and Childsmile schools twice a year from the age of 3 years and in Childsmile practice twice a year from 2 years.

Theoretically, this means a child could receive fluoride varnish four times a year (twice in Childsmile practice and twice in nursery or school); this is still within the safe limits for either acute toxicity levels or chronic ingestion resulting in fluorosis.

The optimum benefit would be if the child were to receive the four doses equally spaced throughout the year, but this may be difficult logistically.

Even if the child were to receive the nursery dose and the practice dose on the same day, there would be no risk of toxicity as two doses would give the child 11.3mg of available fluoride, still well within the dose safety margin.

There would also be very little chance of fluorosis, even with two doses given in quick succession as, after the age of 4 years, most of the adult teeth will have already calcified.

Table 1: Calcification average dates

Tooth	Central incisor	Lateral incisor	Canine		
Calcification begins (age in months)	4 months	12 months	5 months		
Calcification finishes (approx)	2.5 years	3 years	3.5 years		
Tooth	First premolar	Second premolar	First molar	Second molar	
Calcification begins (age in months)	24 months	30 months	birth	3 years	
Calcification finishes (approx)	4 years	4.5 years	2 years	5 years	

As can be seen from the table, most of the teeth, and certainly the anterior teeth, will have calcified by the age of 3.5 years. Although the varnish applications start in Childsmile practice at two years, they do not start in Childsmile nursery until three years so there is a very short time, in relation to the calcification dates, when the children potentially receive both doses.

Advice and aftercare

Children should not take any topical fluoride supplements (tablets, drops or mouthwash) for two days after the fluoride application. After that, continue as directed.

It is important that the fluoride varnish remains on the teeth for the rest of the day and overnight to provide the best possible benefit.

Childsmile recommends:

- children should eat soft foods for the rest of the day to reduce chewing
- children should not brush their teeth that evening but should continue to brush twice a day with fluoride toothpaste from the following morning.

The Childsmile programme avoids giving out ‘negative’ health messages where fluoride is concerned.

It is recommended only to advise not to brush on the evening of the application. The importance of starting to brush again the following morning, as part of a twice daily routine, should be reinforced.

Children involved in the nursery and school aspect of the programme receive a [fluoride varnish aftercare leaflet](#)[\[http://child-smile.org.uk/documents/5275.aspx\]](http://child-smile.org.uk/documents/5275.aspx) that they should take to their dentist informing them when they have had the varnish applied.

Fluoride is a very safe material to use. Fluoride is a naturally occurring element and is present in some water supplies around the world.

- [About Childsmile](/professionals/about-childsmile.aspx)
 - [Dental practice staff](/professionals/information-for-dental-practice-staff.aspx)
 - [Nurseries and schools](/professionals/information-for-schools-and-nurseries.aspx)
 - [Toothbrushing Programme National Standards](/professionals/childsmile-core/toothbrushing-programme-national-standards.aspx)
 - [Childsmile staff](/professionals/childsmile-staff.aspx)
 - [Training](/professionals/training.aspx)
 - [Resources](/professionals/resources.aspx)
 - *Fluoride varnish*
 - [Why use fluoride varnish?](/professionals/about-childsmile/why-use-fluoride-varnish.aspx)
 - [Fluoride varnish application procedure](/professionals/fluoridevarnish1app.aspx)
 - [Adverse reactions](/professionals/childsmile-protocols/adverse-reactions.aspx)
 - [The collapsed child](/professionals/childsmile-protocols/the-collapsed-child.aspx)
 - [Childsmile manual](/professionals/childsmile-manual.aspx)
 - [FAQs](/professionals/faqs.aspx)
 - [Research and evaluation](/professionals/research-and-evaluation.aspx)
-
- [Accessibility](/accessibility.aspx)
 - [Terms and conditions](/terms-and-conditions.aspx)
 - [Partners](/professionals/partners-and-links.aspx)
 - [Privacy policy](/privacy-policy.aspx)
 - [Sitemap](/sitemap/index.aspx)

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