

FLUORIDE DIETARY SUPPLEMENTS AND FLUORIDE TOOTHPASTES FOR CHILDREN

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This policy document was prepared by R D Holt, J H Nunn, W P Rock and J Page on behalf of the BSPD*. Policy documents produced by the BSPD represent a majority view, based on a consideration of currently available evidence. They are produced to provide guidance with the clear intention that the policy be regularly reviewed and updated to take account of changing views and developments.

INTRODUCTION

Water fluoridation is the most effective means of preventing caries in children¹. Other means of fluoride use have been introduced², but in many areas of the UK failure to implement this measure means that fluoride has been mainly used as fluoride supplements and fluoride toothpastes. Both have come under particular scrutiny as a consequence of growing concern about enamel opacities resulting from too high a fluoride intake during tooth development. However, caries experience in many younger children has changed little over the last decade and the need for prevention remains³.

FLUORIDE DIETARY SUPPLEMENTS

When introduced, dietary fluoride supplements were perceived to be a reasonable alternative where water fluoridation was not possible. They were regarded as valuable both for individuals and as a public health measure. More recently it has been concluded that the cariostatic effect of supplements may be less than was suggested in early trials^{4,5}. The initial dosage schedules were introduced before fluoride toothpastes were widely available. They were set to emulate the effects of drinking 1000 ml of water fluoridated at 1 mg per litre⁶, but it would appear that children rarely drink as much as half this amount⁷. More than one study has shown an association between use of fluoride supplements and enamel opacities⁵. Supplements also demand a high degree of cooperation over a long period^{8,10} and it has been suggested that recommendations should not only be reduced but also simplified in order to encourage co-operation¹¹.

*The British Dental Association, The British Society of Paediatric Dentistry, The British Association for the Study of Community Dentistry, and manufacturers of fluoride supplements are currently working together to establish consistent and simplified dosage instructions for fluoride supplements.

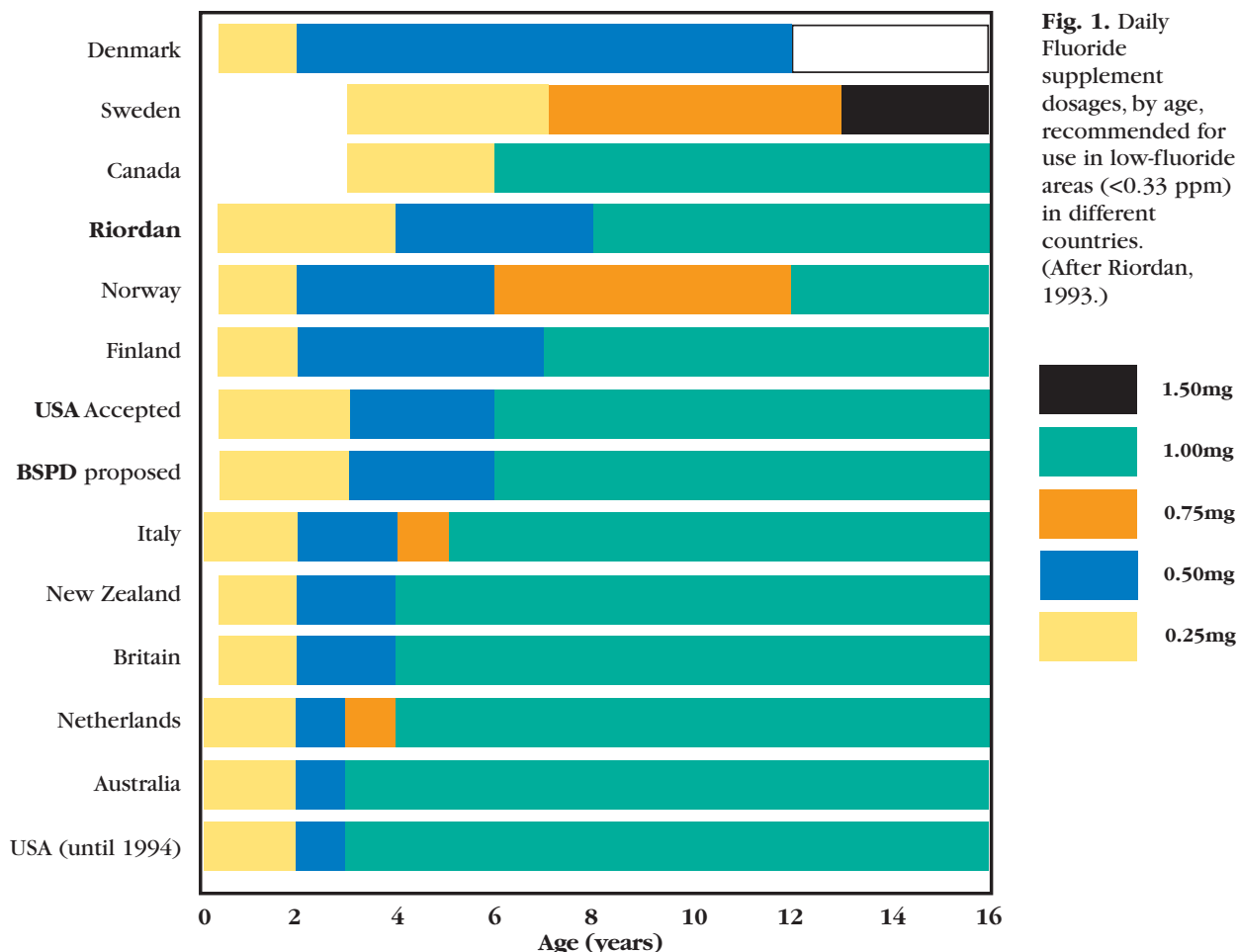


Fig. 1. Daily Fluoride supplement dosages, by age, recommended for use in low-fluoride areas (<0.33 ppm) in different countries. (After Riordan, 1993.)

It is agreed that dietary supplements are not generally suitable as a public health measure and that they should be directed towards children who require them and who live in areas with suboptimal water fluoride levels. Children who stand to benefit include those for whom caries or its treatment may pose an additional hazard, as well as children thought likely to develop caries. For many of these children the potential disadvantage of mild enamel opacities may be outweighed by the benefits of fluoride supplements. It is also agreed that, when given as tablets, supplements should be allowed to dissolve slowly in the mouth to provide topical as well as systemic effect.⁴ Both to reduce the risk of opacities and to maximise their effectiveness, supplements should not be given at the same time as teeth are brushed.

There has been less consensus as to the most appropriate dosage schedule. A summary of current schedules used in different parts of the world is given in Fig. 1, which is modified from a recent review.⁴ It may need to be accepted that any dosage schedule which includes the critical period of enamel formation will carry some degree of risk of mild enamel opacities, particularly if fluoride ingestion from other sources occurs at the same time. The risk of opacities varies with time; the age of the child is critical, with permanent teeth at risk up to the age of 6 years, and permanent incisors during the first 3 years of life.¹² The caries risk status of a child may also change with time, so that regular reassessment is needed. Parents must be fully involved in the decision and, where a dentist or doctor wishes to prescribe supplements, the risks and benefits need to be clearly explained to allow parents to make an informed choice.

FLUORIDE TOOTHPASTES

Toothpastes containing fluoride were widely introduced in the UK during the 1970s; they have been demonstrated to be effective in reducing caries and are believed to have played a large part in the decline in caries observed in many westernised countries.¹³ Formulations have differed and there have been studies into the effect of varying fluoride concentrations. Reducing the concentration below 1 mgF/g has not always produced a statistically significant reduction in effect.¹⁴ At present, toothpastes on the market include concentrations varying from 0.4 mgF/g of paste to 1.5 mgF/g of paste.¹⁵ Lower fluoride formulations were found to be used by at least 34 per cent of pre-school children in Great Britain in 1992/93.¹⁶ Choice is made difficult by the lack of clear standard labelling on toothpaste packaging. Accreditation of toothpastes is now available. For accreditation by the British Dental Association, manufacturers must submit scientific evidence of clinical efficacy and safety to an expert panel.

Evidence to link opacities to the ingestion of fluoride toothpastes by young children has not always been clear; use of a lower fluoride formulation has resulted in a lower prevalence of opacities, although the association was less marked than that with supplements.¹⁷ The potential risk has been well

documented.^{15,18,19} Relatively small amounts of toothpaste contain sizeable amounts of fluoride, and it has been estimated that the threshold level for opacities may be exceeded by ingestion of toothpaste; this holds true even when the currently recommended pea-sized amount is used.¹⁵

It is the abuse through ingestion rather than the use of fluoride toothpastes which constitutes the main risk of opacities. However, in view of some concern regarding opacities and the fact that toothpaste is very widely used, it would seem sensible to recommend that only small amounts of paste be used, under adult supervision, in the critical phases of tooth development during the first 6 years.

Children considered to be at low risk of caries living in fluoridated areas or using fluoride supplements, should use low-fluoride formulations. Low caries-risk children include regular attenders at the dentist, who have no or well-controlled caries, and those whose parents show a high degree of motivation (including carrying out/helping with, or supervising toothbrushing and exercising good dietary control). Those with a higher risk of developing caries should use a standard paste. For this purpose, children at high risk may be taken to include children with a disability that affects their dental care and those who are medically compromised. Children with numerous new or recurrent carious lesions and with radiographic evidence of progression of lesions, irregular attenders, those having sweetened medicines and/or with poor dietary control and those receiving little assistance with toothbrushing may also be regarded as being at high risk.

Up to the age of 6 years parents must supervise the amount of toothpaste used. From age 6 upwards, anterior teeth are not at risk of opacities, so that higher fluoride pastes may be safely used and should be particularly recommended for children at high risk.

RECOMMENDATIONS

1. Water fluoridation remains a priority. Government should take action to increase pressure on privatised water companies to fluoridate water supplies when requested to do so by local health authorities.

2. Dietary fluoride supplements are not generally a public health measure. They should be recommended only for individual children who are at risk and who live in areas with less than optimal water fluoride levels.

Each case should be decided on its merits, and the risks and benefits of supplements should be fully explained to parents before prescription. A flexible approach should be adopted and a child's risk status regularly reassessed.

3. For children living in areas with water supplies containing less than 0.3 ppm fluoride and who are considered to be at high risk, the recommended dosage schedule should be:

Age	mg F per day
6 months up to 3 years	0.25
3 up to 6 years	0.50
6 years and over	1.00

In areas with water supplies containing fluoride at or above 0.3 ppm F dentists should consider a lower dosage.

4. To reduce the risk of opacities, children under the age of 6 years and considered to be at low risk of developing dental caries should use a toothpaste containing no more than 600 ppm of fluoride. Those with a higher risk of developing caries should use a standard (1000 ppm) paste. Children over the age of 6 should be encouraged to use a standard (1000 ppm) or higher (1450 ppm) fluoride level paste. Toothpastes accredited by the British Dental Association should be recommended.

5. Children under 6 years old should use an amount of toothpaste no greater than a small pea. Formal recommendations should emphasise small, rather than rely simply on pea-sized amount, which may be too much. To reduce the risk of opacities, parents must supervise the amount of toothpaste used during brushing up to the age of 6 years. Help with or close supervision of brushing up to at least 7 or 8 years is recommended to ensure effective plaque removal.

6. To allow informed choice, toothpaste packaging must include clear labelling to indicate the amount of fluoride present, expressed consistently as ppmF. Packaging should also include warnings of the risk of opacities and encouragement to parents to keep toothpastes out of reach of young children.

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