Teeth sealing in Thailand
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Within three days, primary schoolteachers in Bangkok had learnt how to apply caries-preventing sealants on children’s teeth — and did it just as well as dentists could!

The WHO Global Data Bank shows that dental caries in developing countries has been increasing over the past 20 years. Caries on the pits and fissures of the teeth accounts for up to 90% of all caries cases in these countries. The use of pit and fissure sealants has proved to be a highly effective means of preventing and arresting this type of caries. It can be highly recommended for any Third World community where there is a high prevalence of occlusal caries, with little smooth surface caries, limited access to and use of dental care, and low social and economic status.

Although the efficacy of sealants has been well established, they are still not in widespread use because of the rather high costs. Yet a sealant programme can be very cost-effective. Factors affecting the cost depend on the material used, equipment, operators, durability, monitoring and reapplication, patient and tooth selection, and the use of other preventive measures. In developing countries where resources are scarce, some of these factors can be kept to a minimum by employing auxiliary and non-dental personnel instead of a dentist, using a mobile dental van with minimum equipment, and using cotton rolls in place of high-power suction to clear saliva from the tooth surface. Mirrors, suitable lighting and dental probes can be regarded as optimal extras.

The protective effect of sealant — usually a polymerized resin — is determined by its ability to remain firmly attached to the tooth surface. The tooth surfaces are first etched with acid and kept free from saliva during the application and setting of the material. Professional application
in a standard clinical setting equipped with high-power suction would push the cost up comparatively, so that appropriate technologies and personnel are needed for such work in the developing countries.

**Glass ionomer**

The quest for a sealant material that could be simply handled with basic equipment and yet would protect against caries has highlighted the material known as "glass ionomer", a powdered glass material composed of fluoro-aluminium silicate. The main advantage in clinical use of glass ionomers is their ability to adhere chemically without the need to treat the tooth surface with acid before application. The fluoride is slowly released into the surrounding enamel to help prevent caries. Even if the sealant becomes detached, the preventive effect continues since the remains of glass ionomer are still fixed in the fissures of most of the occlusal surface. Reapplication of the treatment and monitoring, which would require trained personnel, is thus avoided.

New teaching and learning approaches, with simulation techniques, now make it possible to train personnel effectively and rapidly to provide this treatment, and the sealant can be applied by non-dental personnel after only a few days of training.

A national oral health survey in Thailand in 1989 indicated that 12-year-old children had an average of 1.5 decayed, extracted and filled teeth, and 77% of these teeth needed restorative care on occlusal pits and fissures. So a project was started to treat primary schoolchildren in Bangkok – a typical example of a city in a developing country experiencing ever greater caries prevalence. The fact that untreated active fissure caries lesions may result in the total destruction of the affected tooth motivated intensive efforts to solve the problem.

Six primary schoolteachers were trained by a dentist during a three-day course. The first day dealt with general knowledge of tooth anatomy, caries and oral hygiene instruction. On the second day, the teacher-pupils learnt to handle, mix and apply glass ionomer sealant on plaster casts of teeth. The third day saw the teachers practising applying the sealants on children, and each teacher treated about six teeth at this session.

The course took place in schoolrooms, using simple, portable dental apparatus. Air blowers operated by a foot pump sufficed to control excess saliva, in addition to cotton rolls. Two schoolteachers acted alternately as operator and assistant in mixing and handling the sealant material.

**As good as the dentist**

The study demonstrated that schoolteachers given this brief training could apply the treatment just as well as the dentist. Although only a small percentage of the sealant remained in position when the children's teeth were checked six months later, a significant reduction in caries was observed after two years, particularly among the younger age group.

The schoolteachers who took part enjoyed the training and appreciated being able to give oral care to the children. They also had a better understanding of the importance of early prevention of caries. The schoolchildren too cooperated well and took better care of their oral hygiene.

This type of sealant lends itself to extensive use in developing countries, but further studies are still needed to develop better fluoride-releasing materials that will be easy to handle in all types of climate, simple to apply, and adhere properly to the tooth surface.

In a community at high risk of caries, sealants should cover pits and fissures on occlusal and other tooth surfaces, especially in newly erupted first and second permanent molars. Fissure sealants should be used in combination with other methods for preventing and treating occlusal caries, such as insisting on regular oral hygiene and the use of toothpaste containing fluoride.

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Sealants are mixed ready to be immediately applied by the schoolteacher.