“ART has not been well received in dental schools”
An interview with Dr Prathip Phantumvanit, Thailand

Dental caries is considered one of the major public health problems in most Asian countries. A simple restoration method developed in Africa in the 1980s based on glass-ionomers is often recommended when it comes to the treatment of widespread carious dentine.

Dr Prathip Phantumvanit: This review confirms more or less the field tests on ART we have conducted in Thailand and other countries in recent years. When we compared the results with amalgam, we found that ART restorations were more successful than amalgam up to eight years of follow-up.

While amalgam is just a normal restoration, ART is so-called “preventive restoration” owing to the fluoride released from the glass-ionomer restorative material used in the procedure. In addition, glass-ionomers are able to chemically seal and fuse with the tooth composition of both enamel and dentine. Amalgam cannot do that and, therefore, can easily cause micro-leakage. ART is also considered environmentally friendly, whereas the mercury used in amalgam has been shown to be hazardous to both the environment and our health.

With this in mind, we believe that ART will be an alternative to amalgam restoration especially in the primary teeth, whose life span is less than ten years.

How commonly is the method used in countries like Thailand?

In Thailand, it is mainly used in primary health care and in rural settings where access to oral health services is limited. Here, three-year-olds have an average of three carious teeth that need restoration and this number even increases further at the age of six. It is absolutely necessary to tackle the caries problem at village-based day-care centres with alternative practical approaches like ART. The simple caries removal without anaesthesia injection and no drilling make it more acceptable, especially for the treatment of young children.

What are the advantages and disadvantages of ART compared with other preventive measures such as water fluoridation?

I believe that owing to its simplicity, with no need for rotary drilling instruments and other sophisticated dental equipment, many old-school dentists hesitate to accept ART as a correct approach to treating caries and I know that some dental associations do not recognise ART as standard procedure for carious restoration and only recommend it for temporary or second-class restorations.

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Aside from paediatric dentistry, community dentistry and public health departments, ART has not been well received in dental schools, especially in the field of operative dentistry. Some dental associations do not recognise ART as standard procedure for carious restoration and only recommend it for temporary or second-class restorations.

Glass-ionomers have significantly improved in recent years. Have you noticed any changes in the long-term fluoride released from glass-ionomer restorative materials, which is directly active in the oral cavity in the area next to the tooth structure, as well as in the adjacent teeth, is very similar to any other prevention measures based on fluoride. Moreover, glass-ionomers on the tooth surface work as a fluoride reservoir in the oral cavity and are slowly released, as well as possibly recharged through the daily use of fluoride toothpaste. Another advantage of ART is the preventive restoration of the existing carious teeth to enhance the rehabilitation of the function of the teeth and to halt the progression of the caries in order to prevent pain and discomfort or even early extraction.

The only possible disadvantage that can cause even dental health care personnel to be involved in the procedure, which is slower, more expensive and time-consuming compared with mass public prevention measures such as water fluoridation.

Are there any factors inhibiting the implementation of ART in public oral health services in Asia?

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The outcome of ART restorations as a result of these developments?

The current high-strength glass-ionomer is accepted for simple posterior teeth restorations, but not yet for complex cases. Many dentists who do restorations regularly are awaiting improved glass-ionomers in terms of wear resistance, flexural strength and aesthetics.

Manufacturers have added ceramic or nano-apatite to the material in an effort to improve its mechanical properties, but as far as I know these developments have not reached market readiness. However, any improved or cheaper glass-ionomer or adhesive restorative material would certainly be welcomed as an alternative to dental restoration with mercury fillings.

Critics also claim that hand instruments cannot remove carious dentine completely. What are the limits of ART?

The overall question is: how clean must a cavity be before restoration? Edwina Kidd, Professor of Cariology at King’s College in London, put forward this question in 2004.

What she found was that a certain amount of softened and demineralised dentine can be safely left under glass-ionomer restorations, provided the margin is completely sealed around its full circumference. Glass-ionomers can completely seal at the margin between the glass-ionomer and the tooth structure.

Coincidently, Prof. Kidd’s findings support ART, which has used glass-ionomer material from the very beginning. Moreover, an increasing number of papers support that partial caries removal can prevent accidental exposure of the pulp and cause less pain to patients. More important is that ART is a most conservative technique that saves sound tooth structure, which is now considered minimally invasive dentistry.

There is definitely a limitation to ART, which is similar to any dental restoration. For example, ART cannot be applied to completely exposed teeth, a fistula opening or in the case of a patient with a history of gum swelling or severe pain that needs endodontic treatment rather than normal restoration.

It is claimed that ART was developed in such a way that it can also be performed by non-dental health care workers. Is there any evidence that supports this?

Owing to the simple procedure of ART, it has been suggested that it could be performed by non-dental health workers to make the restoration more accessible to remote populations. However, those health care providers need to be well trained and carefully monitored especially in terms of case selection, handling of the instruments and mixing of the glass-ionomer. To my knowledge, most countries do not allow non-dental personnel to perform any procedure in the oral cavity currently. Therefore, dental auxiliaries, such as dental therapists, dental nurses or even dental hygienists, are still the key performers of ART besides dentists.

The WHO and the FDI World Dental Federation consider dental caries a chronic disease, especially in developing countries. Do you think that ART could help to overcome the epidemic? WHO has put much effort into health promotion as key to overcoming the epidemic of tooth decay, but there is already an existing caries problem in almost every age group, especially in children. ART could definitely be a suitable method for making dental restoration more accessible to people in developing countries. Joint initiatives between health promotion and ART for the future of cavity-free communities will definitely support the Global Caries Initiative put forward by the FDI.