

**WHO Oral Health Country/Area Profile Programme**

WHO Headquarters Geneva, Oral Health Programme (NPH)

WHO Collaborating Centre, Malmö University, Sweden



Selected Section: Projects of Special Interest

ART - Atraumatic Restorative Treatment

Link to: [ART-introduction](#) (with pictures).

This presentation is based on references 1-3, see end of page.

Atraumatic Restorative Treatment (ART): A New Approach for controlling Dental Caries.

Introduction

Although dental caries has substantially decreased in the industrialized countries, it remains to be a widespread problem all over the world. Most of the carious teeth in the developing countries tend to go untreated to such an extent that the only treatment option available is extraction.

Atraumatic Restorative Treatment (ART) approach was developed to suit the needs of the developing countries. ART includes both prevention and treatment of dental caries. This procedure is based on excavating and removing caries using hand instruments only and restoring the tooth with an adhesive filling material such as glassionomer .

Unlike the conventional methods ART is non-threatening, not painful therefore does not need anaesthesia, does not use expensive electrically driven equipment and can be provided at low cost. This technique is simple enough to train non dental personnel or primary health care workers. All one needs are a flat surface for the patient to lie, a stool for the operator and the necessary instruments and materials for ART which can easily be carried in a small bag. ART therefore is suited for people residing in remote areas and for field practise and can be carried out in schools, village halls or in health centers with minimum equipment and resources. ART is a perfect alternative treatment approach for dental caries in the developing countries where as mentioned earlier quite often carious teeth go untreated and eventually have to be extracted.

Community Field Studies with ART

The ART approach was pioneered in Tanzania in the mid 1980s which was then followed by several community field trials conducted in Thailand, Zimbabwe and Pakistan in 1991, 1993 and 1995 respectively. Results of the studies in Thailand and Zimbabwe have shown that 71% and 85% respectively of the ART restorations remained in the teeth after 3 years.

Glass-Ionomer as a Restorative Material in ART

Glass-Ionomers are very useful restorative materials. They are available as a powder and liquid that has to be mixed together. Since they chemically (not mechanically) bind to the teeth, the need to cut sound tooth tissue to prepare the cavity is reduced. These materials continue to release fluoride after setting which has the added advantage of arresting and preventing caries around the restorations. Glass-ionomers are harmless to dentine and pulp tissues. However compared with other materials glass-ionomers are not strong enough and are currently being improved by the manufacturers.

Instruments and Materials essential for ART

Only hand instruments are needed to perform ART. These are - mouth mirrors, explorers, pair of tweezers, spoon excavators, hatchets or hoes and carvers. A mixing-pad and spatula are also necessary to mix the filling material. Only a few other materials are needed- cotton wool rolls and pellets, petroleum jelly to protect the setting glass-ionomer filling, plastic strips to shape the restorations and wedges to hold the plastic strips to the teeth.

Future Applications of ART

As ART is based on modern concepts of cavity preparation where minimal intervention and invasion is emphasised, this approach is applicable also in the industrialized countries for special groups such as the physically and mentally handicapped and the elderly. ART is a friendly procedure where no electric drills or anaesthetic injections are necessary that it can be used for children and fearful adults.

Indications and Contra-Indications for ART

In general ART is carried out only in the small cavities (involving dentine) and in those that are accessible to hand instruments.

ART is not used when:

1. There is an abscess (swelling) near the carious tooth.
2. The pulp of the tooth is exposed.
3. Carious cavity not reachable with hand instruments.

Conclusions

ART is NOT a compromise but a perfect alternative treatment approach for developing countries and special groups in the industrialized world.

1. ART is a biological approach which requires minimal cavity preparation that conserves sound tooth tissues and causes less trauma to teeth.
2. As ART is painless the need for local anaesthetics are reduced and so is the psychological trauma to patients.
3. Simplifies infection control as hand instruments can easily be cleaned and sterilized.
4. No electrically driven and expensive dental equipment needed which enables ART to be practised in remote areas and in the field.
5. ART approach is very cost effective.
6. Since it is a friendly procedure, there are great potentials for its use among children, fearful adults, physically and mentally handicapped and the elderly.
7. It makes restorative care more accessible for all population groups.

References

1. Atraumatic Restorative Treatment Approach to Control Dental Caries- Manual, WHO collaborating Centre for Oral Health Services Research, Groningen 1997.
 2. Frencken JE et al , Atraumatic Restorative Treatment (ART): Rationale, Technique and Development , J Pub Health Dent, 1996, Special Issue, 56, 135-140.
 3. Barmes DE Forward, J Pub Health Dent, 1996, Special Issue, 56, 131.
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Link to: [ART-introduction](#) (with pictures).

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For more information about ART, see this link from [The Dental Health International Nederland](#).

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**Introduction**

Atraumatic Restorative Treatment (ART) approach includes both prevention and treatment of dental caries. ART procedure is based on excavating and removing caries using hand instruments only and then restoring the tooth with an adhesive filling material (glass - ionomer).

This technique is simple enough to train non-dental personnel or primary health care workers. Unlike the conventional methods ART is non-threatening, does not need expensive electrically driven equipment and can be provided at low cost.

ART is suited in the field - for instance in schools, village halls or in health centers with minimum equipment and resources. All one needs are a flat surface for the patient, a stool for the operator and the necessary instruments and materials for ART which can be easily carried in a small bag. ART is a perfect alternative treatment approach for dental caries in the developing countries where quite often teeth are left to decay to such an extent that they are extracted.



For more details about ART and its background, click [Here!](#)



The following set of pictures are from an ART Manual prepared by Drs Jo Frencken, Prathip

Phantumvanit, Taco Pilot, Yupin Songpaisan and Evert van Amerongen and from Dr Yupin Songpaisan, Thailand.

Recommended work posture and position for the operator.



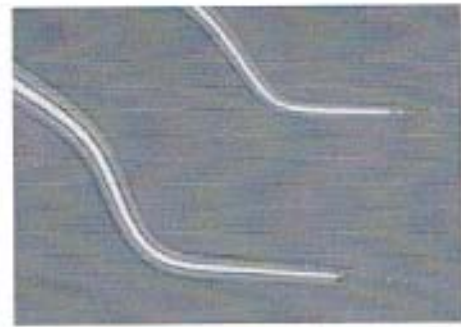
Recommended position for the operator and assistant. The patient lies on a flat surface.



Hand instruments needed for ART are:

mouth mirror, explorer, a pair of tweezers, spoon excavator, hatchet or hoe and carver.





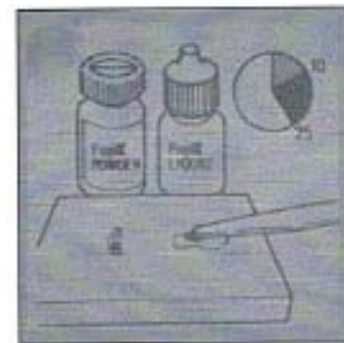
The area around the carious tooth to be treated is kept dry by placing cotton rolls. Then the cavity entrance is widened by using the hatchet or hoe. Now with the excavator caries is removed.



When all caries has been removed and the cavity cleaned and dried a dentine conditioner is applied on the cavity to improve the bonding of the filling material to the tooth.



The glass-ionomer filling material consists of powder and liquid which is mixed on a glass slab or a mixing pad. Mixing is completed in 20 - 30 seconds.



The mixture is inserted to the cavity with the flat end of the carver. The cavity is over filled to include remaining pits and fissures.



Rub some petroleum jelly on the gloved index finger and the filling material is pressed firmly with the finger on the tooth.



The excess material is being removed with a carver.

The patient is not allowed to eat for at least 1 hour. Note no anaesthesia is used and no dental drills are needed during the whole procedure.



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