Dept. of Public Health Dentistry

Pit & Fissure sealant

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INTRODUCTION

- Narrow isolated crevices and grooves → harbour food and micro organisms →caries.
- Physical obstruction of pits and grooves →prevents penetration of fermentable carbohydrates and bacteria.

TYPES

A) Based on Generations

First Generation	Activated by U.V. light. (outdated)
Second Generation	Chemical curing resins based on catalyst-accelerator system
Third Generation	Activated by Visible light
Fluoride containing sealants	Double protection

B) Based on Fillers

1) Free of Fillers- Flow is better
2) Semi filled- more resistant to wear

C) Based on Colours

1)Clear- Aesthetic but difficult to detect

2) Tinted- can be easily identified

3) Opaque-Can be easily identified

Procedure

1. Polish the tooth

   Plaque and debris removal→proper etching and sealant penetration

   Prophylaxis cup and pumice

Cleansing of tooth

As in all dental procedures, one must begin with appropriate cleansing of the tooth. This is done using a prophy cup and pumice with water used. The explorer is run through the grooves to free untapped pumice. Following this, thoroughly wash, dry, and re-examine.

2. Tooth Isolation

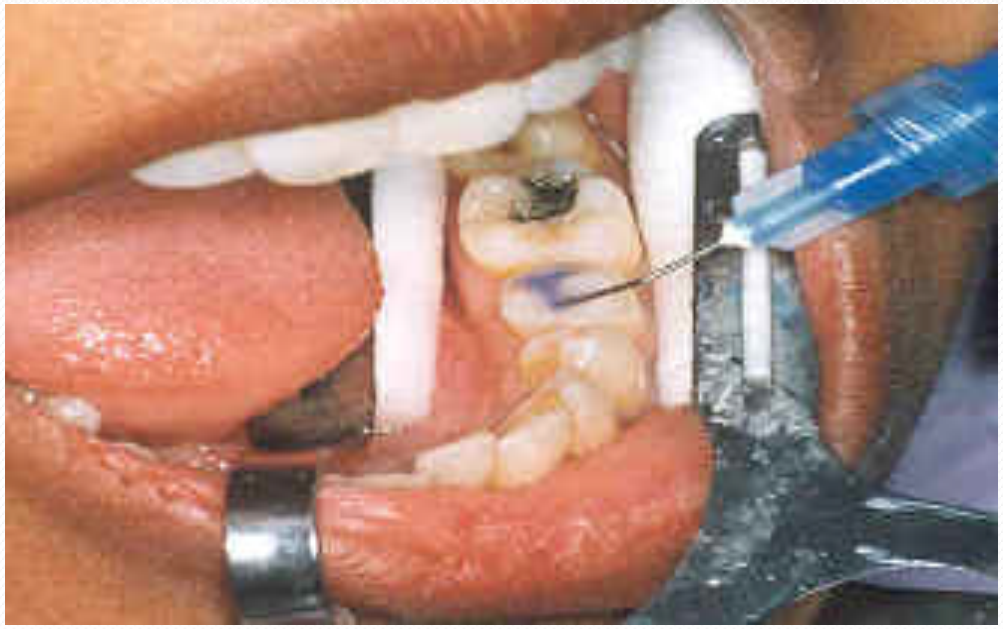
Isolate and dry

Rubber dam / cotton rolls

Note that if the tooth is moistened and contaminated with saliva, the etching must be done over again.

In order to maintain a dry field to work in, rubber dams, cotton rolls and dry angles are used.

3. Enamel Etching



37% phosphoric acid is used to create micro porosities within the enamel, which permits a low viscosity resin (sealant) to flow in and penetrate the roughened (etched) surface, thereby producing a mechanical lock of resin tags. The tooth is etched 20-30 seconds and then fully rinsed and dried. Apply at least few mm beyond the final margins of sealant.

4.Rinsing

For about 15 sec

5.Isolation

Compressed air- free of oil and water

Chalky, frosted appearance of Enamel

Avoid salivary contamination

6.Bonding

7.Sealant Application

Apply sealant→care taken not to incorporate any air bubbles

After setting, wipe the sealed surface with wet cotton to remove air-inhibited layer of non-polymerized resin→no bad taste in patient's mouth

Application of Sealant Material

Now, the sealant material is applied, and a brush is used to allow it to follow the curvature of the tooth

Curing of Sealant Material

Visible UV light is used to cure (harden) the resin/sealant materia

8.Evaluate the sealant

Visually and tactically (attempt to dislodge using an explorer)

9.Check occlusion

10.Retention and periodic maintenance

REQUIREMENTS

- Good moisture control when applying
- Clean surfaces
- Appropriate etching and drying time
- Appropriate coverage of the surface
- Checking occlusion
- Regular monitoring and maintenance

INDICATIONS

- Patients with continuing caries risk who have caries just into dentin
- Requires less cutting of tooth structure and provides full occlusal protection against caries
- Placed over GI cement within cut fissures if space allows

Sealant Retention

- The average results from clinical studies indicate that performance levels for chemical and light initiated sealants are similar with an observation period of 5 yrs.
- Better materials and better use of bonding agents→more effectiveness on teeth
- Adhesive system itself serves as a low viscosity, flowable wetting agent and as interface between etched enamel and filled resin
- Hydrophillic agents overcome inadvertent moisture contamination

INVASIVE TECHNIQUE

- Indicated in cases of deep and narrow fissures that are discoloured and suspected of being carious
- Fissures are widened using a small bur and handpiece before sealant application
- Advantages:

1. Ability to diagnose the extent of carious lesion if present
2. Higher retention rates
3. Decreased risk of microleakage

PREVENTIVE RESIN RESTORATIONS (PRR)

- First reported by **Simonsen & Stallard(1978**)
- Indicated where caries within a fissure has just reached the dentin.
- Procedure: Remove only those areas of tooth affected by caries by hand piece→ bonding resin restorative material into them→finally covering all fissures and the restorative material with sealant.
- The old philosophy of "extension for prevention" replaced with idea of discrete removal of caries→major reduction in intracoronal preparation & tooth str. loss.

Patient/Parent Education

- Importance
- Cost effectiveness when placed on teeth with high risk for dental caries.
- Regular Check up

FLUORIDE CONTAINING SEALANTS

Basically two methods for fluoride incorporation are used:

1. Soluble fluoride salt is added to unpolymerised resin → sealant applied → salt dissolves and fluoride released.
2. Organic fluoride compound is chemically bound to resin.

Since there is no lasting effect on salivary F^- conc., the benefit should be derived from F absorbed into the enamel.

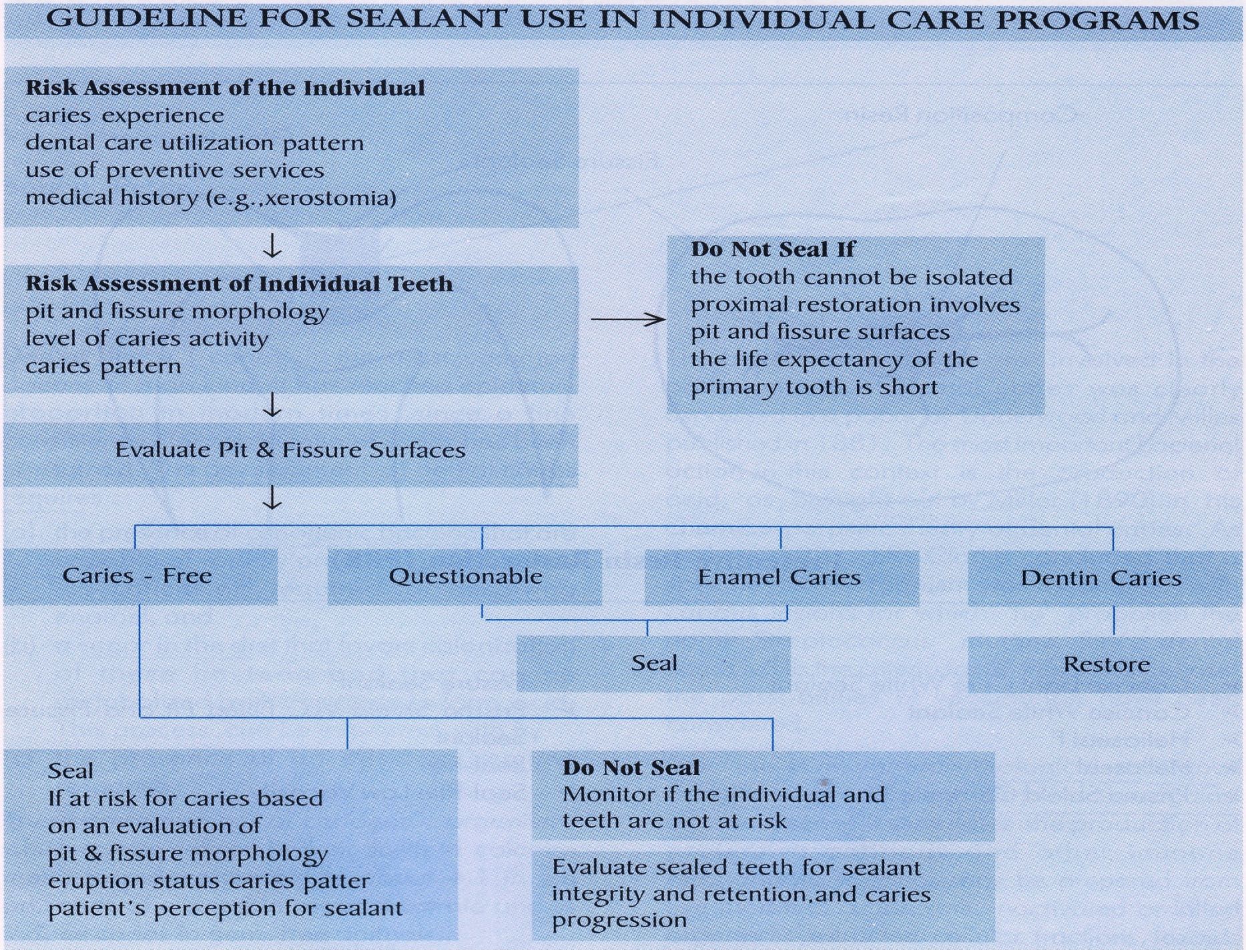
But this is questionable since sealants do not penetrate the depth of the fissures.

COST EFFECTIVENESS

- In population with average caries rates, it is said that 5-10 sealants must be placed to save a molar from becoming carious.
- Cost effectiveness can be minimized by:

1. selective application on teeth with greatest caries risk.
2. Apply sealants in conjunction with optimal fluoride therapy.

GUIDELINE FOR SEALANT USE IN INDIVIDUAL CARE PROGRAMS



Comparison of amalgam

- Considerable tooth loss
- Replacement lead greater loss of tooth structure
- Time –more
- Less tech sensitive
- Cost effective on shorter duration

sealant

- Minimum tooth loss
- Replacement- continuous caries protection and maintenance
- Time –less
- Highly tech sensitive
- Cost effective on longer duration