

Guidelines

*A School-Based
Fissure Sealant Programme*

Second Edition



*Oral Health Division
Ministry of Health Malaysia
2003*

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SCHOOL-BASED FISSURE SEALANT PROGRAMME

GUIDELINES

A SCHOOL-BASED FISSURE SEALANT
PROGRAM

Second Edition

**Oral Health Division
Ministry of Health Malaysia
March 2003**



**FOREWORD BY
THE DIRECTOR FOR ORAL HEALTH
MINISTRY OF HEALTH MALAYSIA**

Globally, there is change in caries pattern with caries decline. Caries now principally involves pits and fissures of teeth. This has led to increasing use of fissure sealants for clinical prevention of caries. Over the last 30 years, oral health data on Malaysian school children have shown a similar caries decline. The National Oral Health Survey of Schoolchildren 1997 (NOHSS '97) officially documented occlusal surfaces as being about four times more caries-susceptible than other surfaces.

On the strength of the 1997 data, guidelines were formulated for an integrated school-based fissure sealant programme implemented in 1999.

This second edition guidelines aim to strengthen the programme, in particular the need to continuously monitor the impact of the large-scale programme on overall caries pattern and decline in Malaysia. The programme incorporates dental nurses to render fissure sealants through an 'outreach' strategy. In the Malaysian context, the school-based programme utilises a targeting strategy for children at risk to occlusal caries.

I take this opportunity to extend my warm appreciation to all officers involved in the programme planning and implementation, and who have continued with reviewing the policy for the school-based fissure sealant programme. It is hoped that success of the strategy will translate into further caries decline in Malaysia.

Rohani Ramli

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Members of the Working Group welcome comments and constructive suggestions pertaining to any aspect of these guidelines.

GUIDELINES :

SCHOOL-BASED FISSURE SEALANT PROGRAMME

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SCHOOL-BASED FISSURE SEALANT PROGRAMME
GUIDELINES FOR IMPLEMENTATION : SECOND EDITION

1. INTRODUCTION

Recent oral health data of school children in Malaysia shows evidence of a decline in dental caries experience between 1970/71¹ and 1997². There was an overall decline in mean caries experience of 56.8% in 12-year-olds and 41.7% in 16-year-olds over the 17-year period. In Peninsular Malaysia, the mean DMFX(T) of 12-year-olds decreased from 3.7 in 1970/71 to 1.6 in 1997; and the mean DMFX(T) of 16-year-olds decreased from 4.8 in 1970/71 to 2.8 in 1997. The recent study also documented occlusal surfaces as constituting the majority of carious surfaces - approximately 44% and 39% of carious occlusal surfaces in the 12- and 16-year-olds respectively, compared to a range of approximately 12% - 17% for mesial and distal surfaces. More than 71% of teeth with carious experience had occlusal surface caries in both the 12- and 16-year-old age groups. The teeth commonly affected by dental caries were observed to be the first and second permanent molars, with the first permanent molars being twice more affected than the second permanent molars. These facts serve to emphasise the need for fissure sealants to overcome the majority of dental caries now observed in Malaysia.

A fissure sealant is defined as a material that is placed in the pits and fissures of teeth in order to prevent or control the development of dental caries.

In the context of the Malaysian school dental programme, fissure sealant application is considered a preventive procedure and not a restorative procedure. Fissure sealant is thus defined as non-

invasive. However, a preventive resin restoration (PRR), with or without a fissure sealant, is an invasive procedure and is considered a restorative procedure.

The definition of 'No Treatment Required (NTR)' as used in the Health Management Information System (HMIS) applies, that is, cases that do not require invasive procedures. As fissure sealants are considered prophylactic and non-invasive, cases requiring only fissure sealants are thus considered as NTR cases.

2. BACKGROUND OF THE FISSURE SEALANT PROGRAMME IN MALAYSIA

The fissure sealant programme was started as a pilot programme in the Federal Territory Kuala Lumpur in 1987-1988 and subsequently expanded ad-hoc in many states. In 1993, a special allocation was granted for the purchase of equipment for the programme. Portable cutting instruments purchased since then, have specified oil-free compressors. In 1998, standardised guidelines were formulated for the conduct of a national school-based programme, and the programme was subsequently launched in 1999. However, collection of fissure sealant data has pertained only to performance indicators - the number of children involved, the number of teeth rendered fissure sealants and the number of sealant re-applied.

Based on feedback received from two workshops conducted in Malacca and Johore Bahru in 2000 and 2002 respectively, a decision was made to review the 1999 guidelines, in particular the need to continuously monitor the impact of the programme on caries. Current aspects of fissure sealants were reviewed, including clinical techniques, criteria for patient selection, cost-effectiveness and current practice and programmes. Discussions centred on longitudinal evaluation of cohort groups starting at age 8 years upwards.

2.1 PRE-REQUISITES FOR A SCHOOL-BASED FISSURE SEALANT PROGRAMME

The necessary prerequisites for a school-based fissure sealant programme rest on the availability of dental officers and

nurses trained in the use and application of fissure sealants, and on the procurement of oil-free portable equipment (vacuolyser, 3-way syringe and oil-free compressor) and materials. These factors will determine the expansiveness and sustainability of the school-based programme. The following suggestions are made.

- i) The fissure sealant programme may have to start on a small scale initially, based on the availability of trained personnel and equipment, and later expand as and when procurement of the necessary equipment and materials is made.
- ii) Continuing education on the rationale for an outreach school-based fissure sealant programme and the techniques involved must be a **team approach** involving both dental officers and nurses.
- iii) There must be emphasis on meticulous procedures in the field conditions of the school incremental dental care programme.
- iv) The application of fissure sealants as an integral part of the school-based programme, and not merely as a clinical prevention procedure, should be incorporated into the training programme for dental nurses at the Dental Training College, Penang.
- v) The rationale for a fissure sealant programme as part of the school incremental dental care must be emphasised to all new dental officers.
- vi) Planning at state and district levels must be towards realistically sustaining the programme; the factors for priority setting undertaken for incremental dental care should also be utilised in setting priorities for the school-based fissure sealant programme.
- vii) Priority setting must veer towards prevention of dental caries in the younger age groups.

3. OBJECTIVES OF GUIDELINES

3.1 General Objective

The general objective of these guidelines is to establish a standardised, comprehensive and systematic fissure sealant programme as an integral part of the Malaysian incremental dental care programme for schoolchildren.

3.2 Specific Objectives

- To implement a school-based fissure sealant programme starting at Year 1 primary school children upwards as part of the Incremental Dental Care.
- To monitor performance in terms of need for fissure sealant and fissure sealant rendered.
- To assess trends of occlusal caries occurrence in relation to total tooth decay for 12 year-olds.

4. METHODOLOGY

4.1 Target Population

The programme shall cover all schoolchildren under the incremental dental care programme starting at Year 1 upwards. Selection of schoolchildren shall be based on the selection criteria. Nevertheless, children with special needs, for example, the handicapped, the medically compromised or those from an obvious disadvantaged social background shall be given priority.

4.2 Implementation

The programme shall be undertaken by teams of dental officers and nurses as part of the “outreach” incremental dental care programme, and shall be co-ordinated by the District Senior Dental Officers, with the assistance of the local Dental-Officers-in-Charge.

4.2.1 Criteria

I. Criteria for School Selection

Selection of schools shall be at the discretion of district/state management. Following priority-setting between schools, there shall be priority-setting for selection of children considered “at-risk” to occlusal caries (**Figure 1**).

II. Criteria for Patient Selection

The use of the probe is to be limited to removing debris. There must be no excessive probing of pits and fissures.

A consideration of the following factors will help towards making a decision on patient selection (**Figure 1**). The initial application of these criteria, individually or in combination, **must** be supported by a consideration of the tooth/teeth of the children.

- Children who have had caries experience in one or more of their first and second permanent molars.
- Children who have had caries experience in their first permanent molars shall be

considered for fissure sealing of their second permanent molars.

- Children with $dft \geq 3$ in the mixed dentition stage of Year 1, 2 and 3.
- Children with special need e.g. the handicapped, the medically compromised and the socially disadvantaged.

To select potential candidates for fissure sealants, look at the general oral condition of the child. Is the oral hygiene good, moderate or poor? Is the child co-operative? Go on to assess the morphology and depth of the fissures of the permanent molars. Are they deep and complex-patterned? Are there chalky occlusal appearances, occlusal restorations or fissure sealants? How many teeth have had caries experience? Are contra-lateral first and permanent molars involved?

Once a child is selected for fissure sealant application, the procedure can be undertaken immediately, or recall for fissure sealant application may be on a separate occasion in the same year.

III Criteria for Tooth Selection

If recall for fissure sealant application is on a separate occasion, reassess tooth/teeth. A general examination should look for stains, signs of decalcification (chalky white enamel) or frank caries (**Figure 2**). Where caries is suspected to be in dentine or approximal areas, the light should be shone at various angles to help determine the presence and depth of caries.

Consideration of a combination of the following factors will help towards tooth/teeth selection for fissure sealant application.

- Caries-free first and second permanent molars exhibiting deep and/or complex fissure patterns.
- First and second permanent molars exhibiting incipient enamel lesions e.g. chalky white lesions.

However first and second permanent molars exhibiting caries with entry into dentine can be considered for a preventive resin restoration.

The selected tooth/teeth shall

- have all fissures visible to enhance ease of moisture control by limiting moisture from crevices;
- exhibit presence of deep and/or complex pattern(s) of pits and fissures;
- have no existing restoration; and
- exhibit(s) no signs of approximal caries.

Teeth to be excluded

- Deciduous teeth
- Teeth with shallow and coalescent fissures
- Teeth with frank caries (caries which has entered dentine layer)
- Teeth exhibiting signs of approximal caries
- First and second permanent molars, which are not fully-erupted (keep in view / KIV).

4.2.2 Fissure Sealant Application

The difficulty of frequent recall in a school-based programme might necessitate the following - children who exhibit excessive materia alba and plaque must be made to brush their teeth prior to prophylaxis for sealant application. The general principles of fissure sealant application must be applied at all times **(Figures 3 and 4)**.

The tooth/teeth (and working field)

- must not be contaminated with oil at any time (oil-free field)
- if using resin based sealants, must be adequately etched according to manufacturer's instructions
- must be irrigated and dried after acid-etching for resin based sealants
- must be dry, clean and without contamination prior to placement of sealant material.

Appendix 1 lists equipments and materials for the programme.

4.2.3 Criteria for Fissure Sealant Re-application

A tooth shall be considered for a fissure sealant re-application when there is total or partial loss of sealant with an obvious catch when probed. The criteria for tooth selection (4.2.III) shall be applied.

4.3 Monitoring and Evaluation

A State Co-ordinator shall be appointed by the respective State Deputy Director of Health (Dental) to monitor and evaluate the outcomes of the programme at state and district levels.

**Note*

Evaluation of the outcomes of the school-based fissure sealant programme : A longitudinal study

A longitudinal study on a cohort group of 8-year-olds shall be undertaken concurrent with the school-based programme to capture data for identified indicators. The study shall be co-ordinated by dental public health officers identified by the State Deputy Directors of Health (Dental).

All personnel involved in the school dental programme are required to attach and complete format FS 1/2003 for 8 year-olds (Year 2 schoolchildren only) in year 2003 (or in subsequent years when instructed by the Oral Health Division) in readiness for the longitudinal study.

4.4 Data Collection

Data shall be collected through

- the manual/computerised HMIS format (PG 307 and PG 201)
- specific dummy tables built for this programme (**Appendix 2 and 3**)
- FS 1/2003 (**Appendix 4**) for 8 year-olds (the cohort group for the longitudinal study). This form is to be attached to LP8.

The link between the school-based programme and the longitudinal study is illustrated in **Appendix 5**.

4.5 Data Flow

The compiled district and state data shall be channelled to national level by the end of February of the following year. Each district/state must be responsible for the monitoring and evaluation of its individual school-based fissure sealant programme.

Figure 1

Stage 1: FLOW CHART FOR SELECTION OF
SCHOOLS/PATIENT/TOOTH

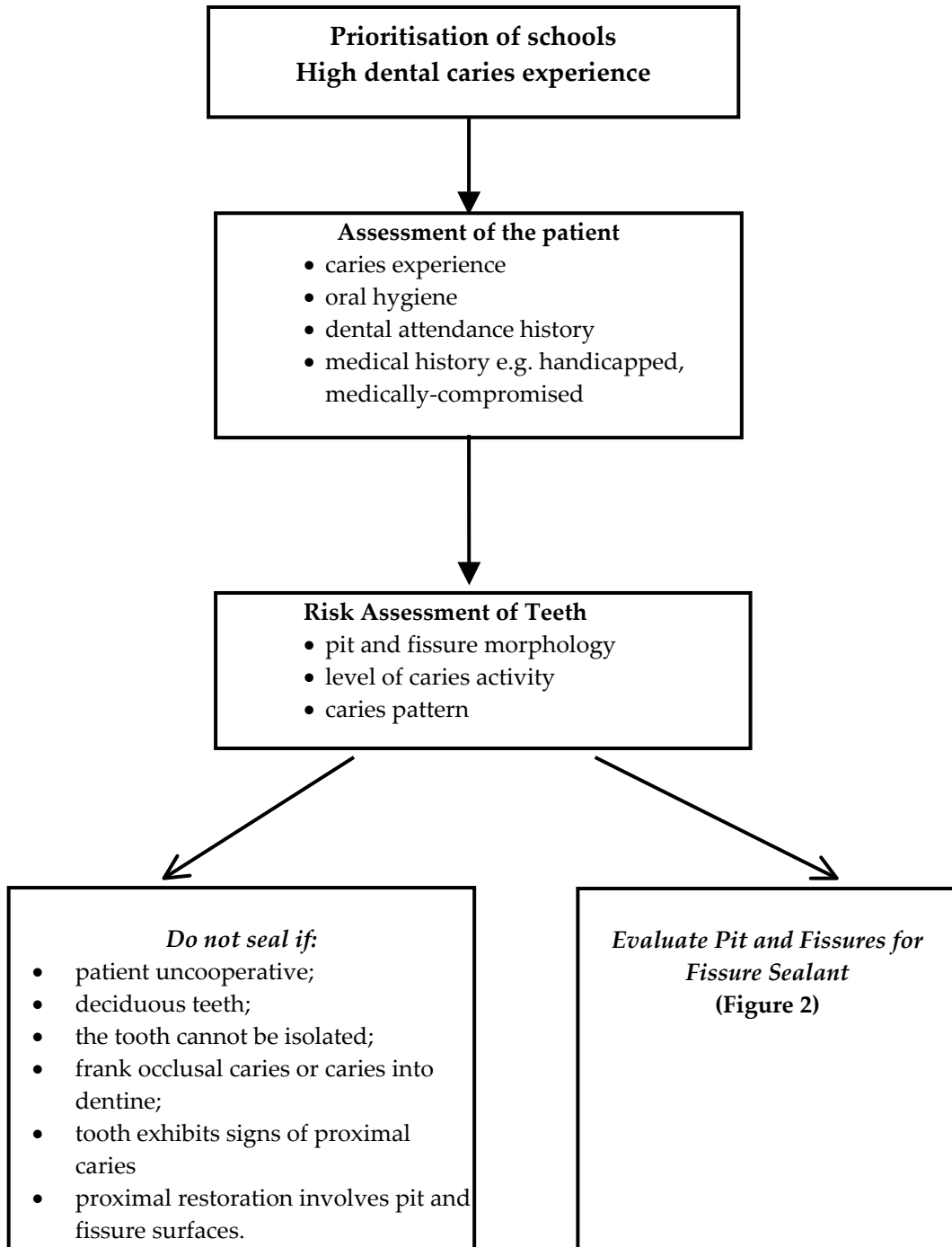
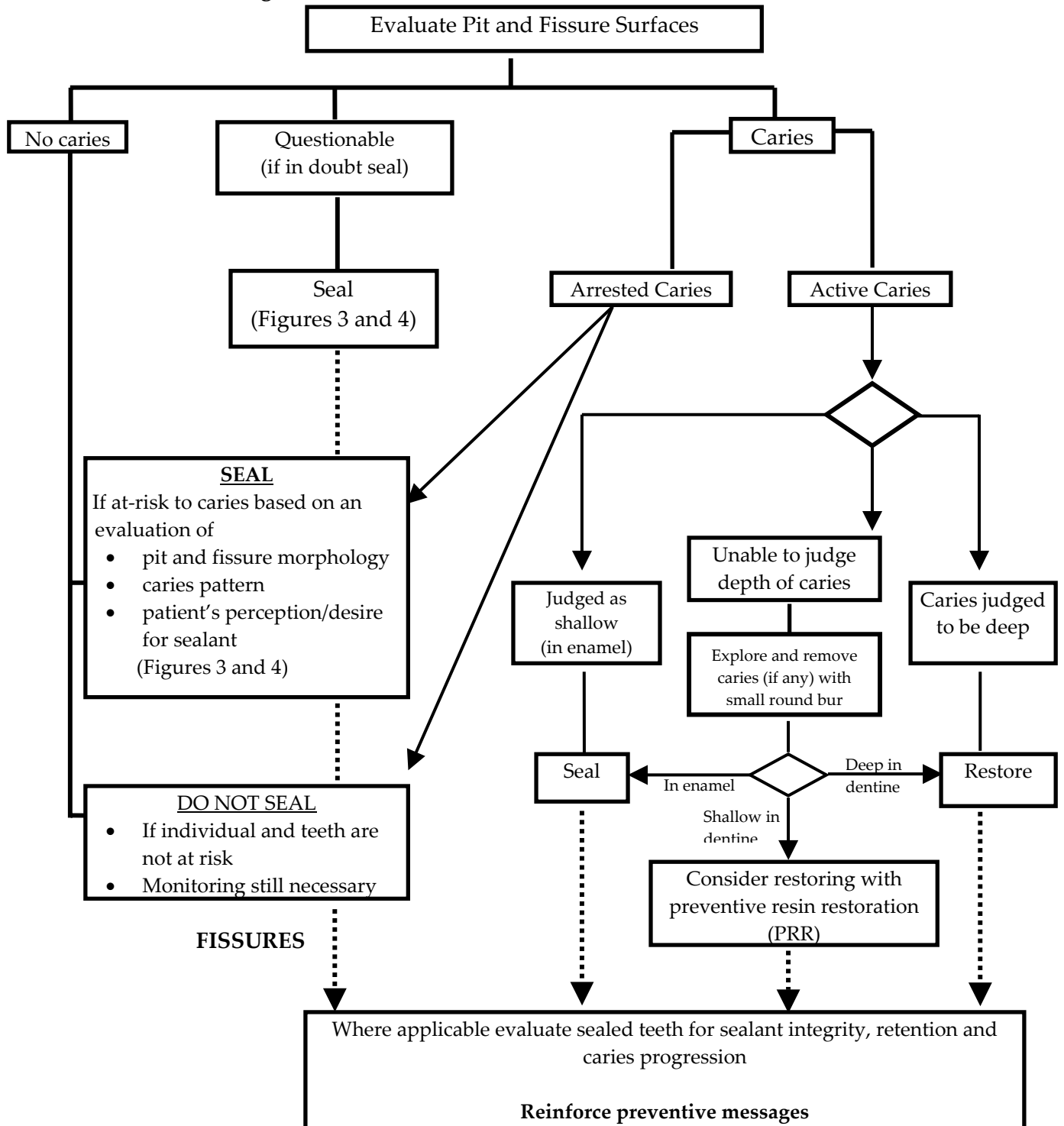


Figure 2

Stage 2: CRITICAL STEPS FOR EVALUATING PITS AND



For **Preventive Resin Restoration** techniques, refer to the following monograph: *Zamzuri AT, Wan Othman WMN. Preventive Resin Restoration: Monograph No.2. Children's Dental Centre and Dental Training School, Penang, Malaysia 1995.*

Figure 3

CRITICAL STEPS FOR FISSURE SEALANT APPLICATION

(RESIN-BASED SEALANTS)

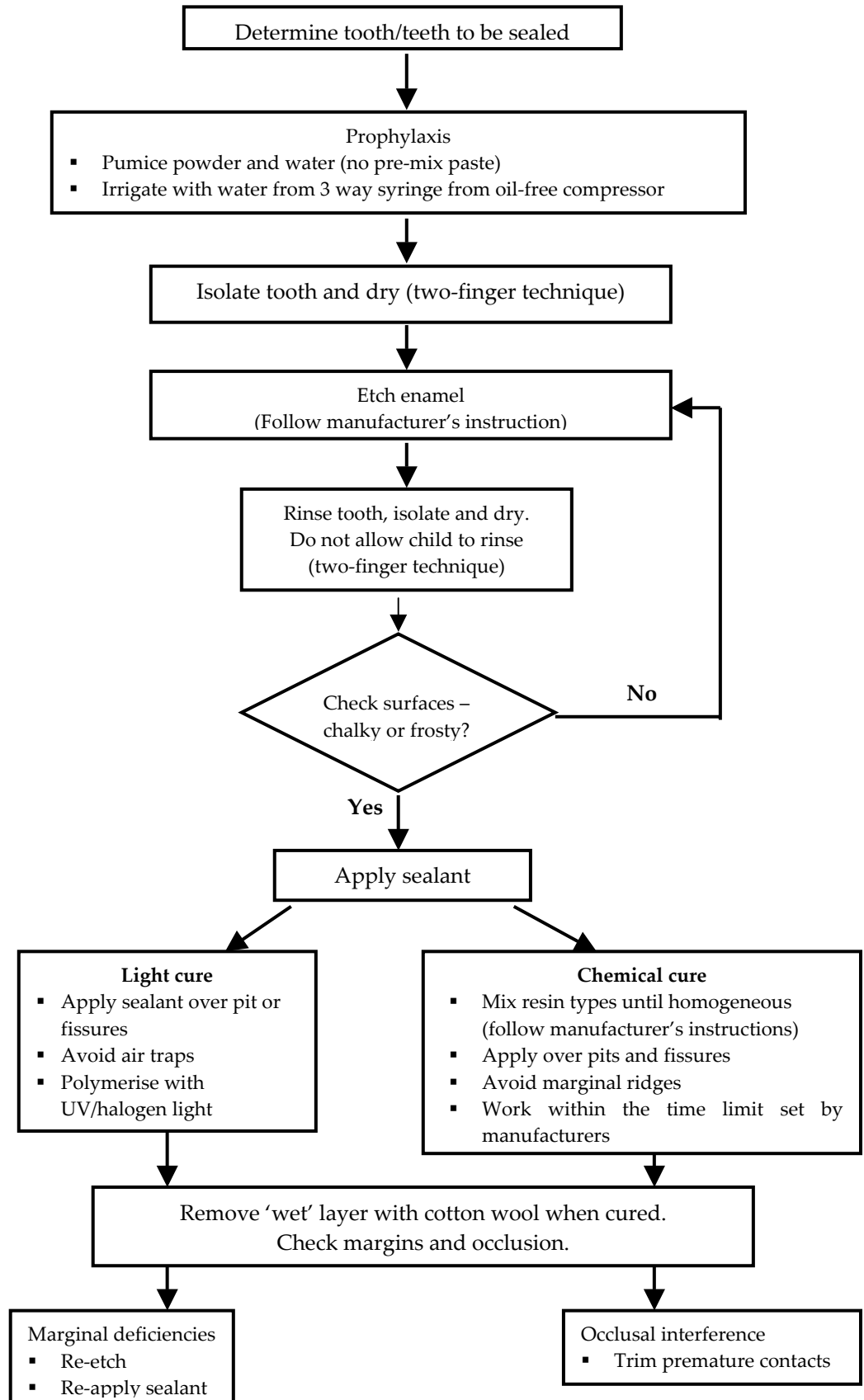
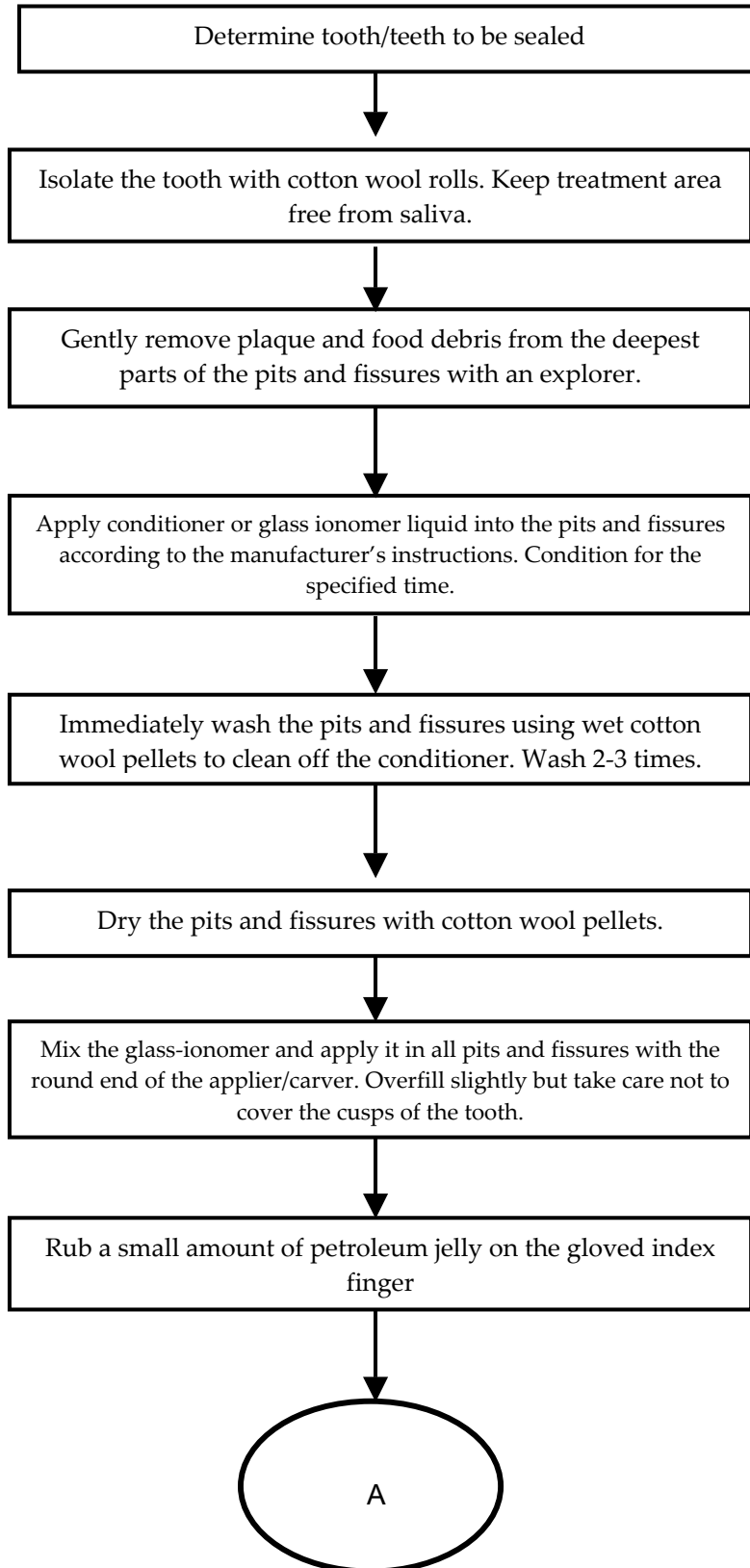
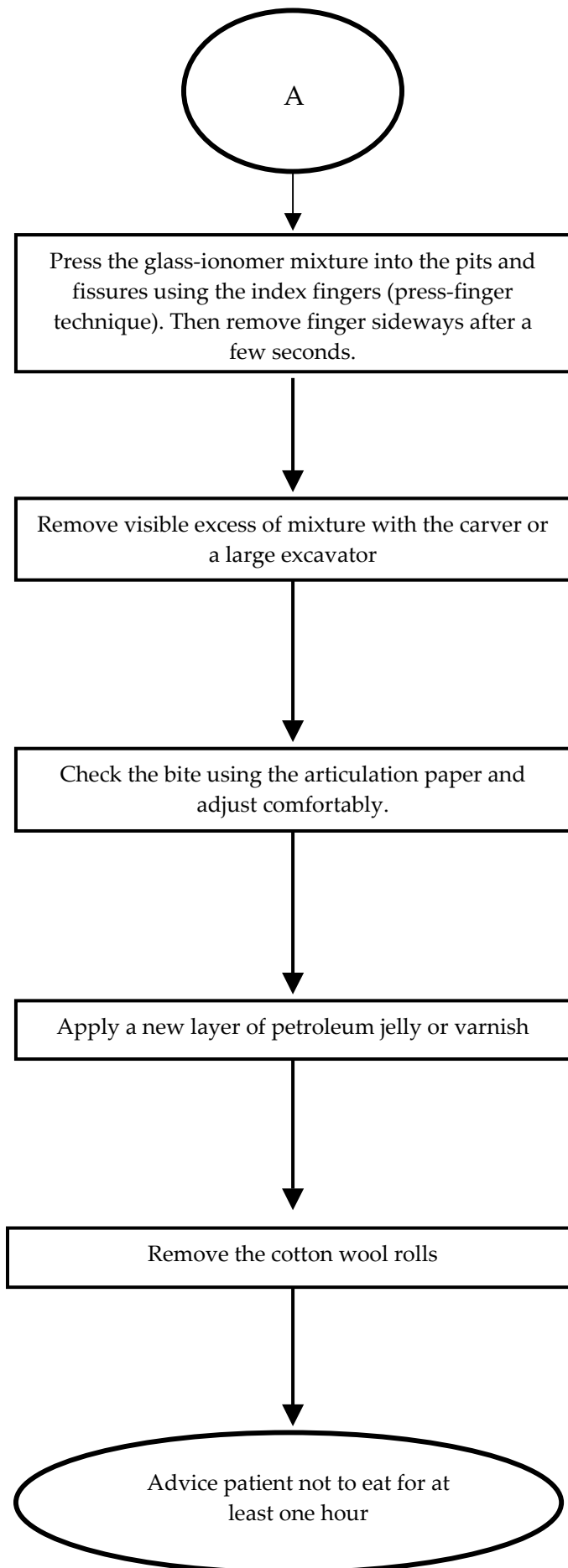


Figure 4
STEP-BY STEP GUIDE TO THE PLACEMENT OF GLASS
IONOMER SEALANTS





APPENDICES

LIST OF EQUIPMENT AND MATERIAL

Basic requirements for a school-based fissure sealant programme:

Equipment

- Portable cutting unit with oil-less compressor
- Oil-free 3-way syringe
- Vacuolyser and suction tips
- Light cure equipment (if using light cure resin)
- Portable chair
- Portable light
- Basic dental instruments

Materials

- Self-cure or light cure composite resin kit (Opaque/tinted) or Glass Ionomer Cements
- Cotton rolls
- White stones for occlusal adjustment of sealant
- Articulating paper
- Petroleum Jelly / Vaseline (if using glass ionomer cement)
- Dentine conditioner (if using glass ionomer cement)

(Information to be extracted from HMIS PG 201)

Table 1: Fissure Sealant Treatment Need and Treatment Rendered by Year of School Children

School/Clinic/District/State: _____

Calender Year	Class (Standard)	No. examined	FS Treatment Need			FS rendered			
			No. of subjects	No. of teeth	% subjects	No. of subjects		No. of teeth	
						n	%	n	%
1	2	3	2/1 X 100	4	4/2X100	5	5/3X100		
	Year 1								
	Year 2								
	Year 3								
	Year 4								
	Year 5								
	Year 6								
	<i>Total</i>								

Table 2 : Trend data of decayed teeth with occlusal caries in Year 6 children over 5 years

School/Clinic/District/State: _____

	No. of teeth carious experience (D + F) (include all teeth)	No. of teeth with occlusal caries experience (D + F)			
		All types (Class I and II)		Class I only	
		n	%	n	%
200__					
	1	2	2/1 x 100	3	3/1X100
200__					
200__					
200__					
200__					

*PG 307 (for Year 6 school children only) can be modified to yield these results

In this table, decay (D) **does not include** teeth indicated for extraction (X).

lass I – involving occlusal surface only

Class II – involving occlusal surface + other surfaces

RECORDING CRITERIA FOR FS 1/2003

CHILD STATUS REPORT OF FISSURE SEALANT APPLICATION

School Enter the name of the school

Name of patient Enter child's name

Clinic Enter the clinic responsible for the management of the school

District/State Enter the district and state responsible for the management of the school and clinic

Year / Class Enter the year and name of the child's class for that year e.g.

Year	2003	2004
Class	Std. 2 A	Std. 3 C

*Initial Application/
Material Used* Record the date of first application. Tick (✓) whether resin or GIC used.

*Columns 1st to 5th Year
Review* Enter the date of subsequent review. Enter the status of the fissure sealant

Year(s) of review Enter the date of review e.g. if the initial application is in the the year 2003 then the 1st Year Review is in the year 2004, the 2nd Year Review is in the year 2005 and so on. Indicate the status of the fissure sealant and tooth for each year of review.

Status of fissure sealant	<p>Use one of the following codes</p> <p>I = Intact Sealant</p> <p>NI = Not Intact, do not require redo</p> <p>R = Redo/Replace Sealant (see definition below)</p> <p>F = Failed fissure sealed tooth (see definition below)</p>
Failed fissure-sealed tooth	<p>Prevention of caries is considered to have failed when the tooth develops caries on any surface (please indicate the carious surface). This definition includes the following:</p> <ul style="list-style-type: none"> • The sealant has failed leading to caries. • Prevention of caries has failed when decision to render fissure sealant has not accounted for possible caries occurrence on other surfaces.
Redo/Replace Sealant	The sealant is deemed to have been totally lost or there is partial loss of sealant with an obvious catch when probed, and requires redo.

CHILD STATUS REPORT ON FISSURE SEALANT APPLICATION

School.....

Clinic.....

Name of Patient.....

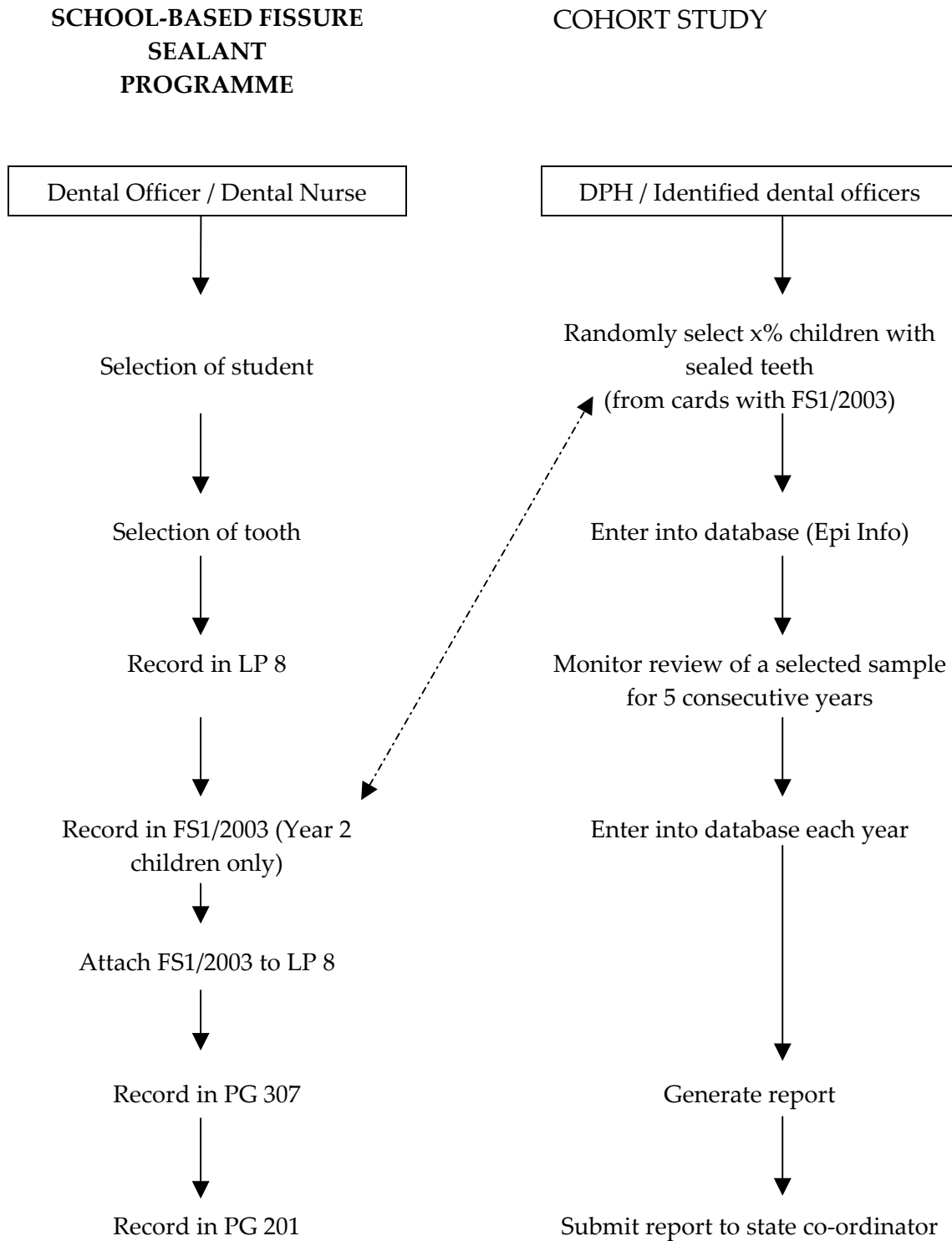
District/State.....

Year	2003	2004	2005	2006	2007
Class	Std. 2 _____	Std. 3 _____	Std. 4 _____	Std. 5 _____	Std. 6 _____

1 st Perm. Molar	Sealant Application (Record date of application/review and status of FS)							
	Initial Application			Date/Status	Year 1 Review	Year 2 Review	Year 3 Review	Year 4 Review
	Date	Material (√)						
Resin		GIC						
16				Date				
				Status				
26				Date				
				Status				
36				Date				
				Status				
46				Date				
				Status				

2 nd Perm. Molar	Sealant Application (Record date of application/review and status of FS)							
	Initial Application			Date/Status	Year 1 Review	Year 2 Review	Year 3 Review	Year 4 Review
	Date	Material (√)						
Resin		GIC						
17				Date				
				Status				
27				Date				
				Status				
37				Date				
				Status				
47				Date				
				Status				

FLOW CHART FOR DATA COLLECTION



GLOSSARY OF TERMS

- | | | |
|----|---------------------------------|--|
| 1. | Sound tooth/caries free tooth | No evidence of treated or untreated caries on any of its surfaces |
| 2. | Incipient / questionable caries | <p>A tooth is deemed to have incipient or questionable caries if it exhibits the following:</p> <ul style="list-style-type: none"> • chalky white appearance on its surfaces; • discoloured or rough spots; • stained pits and fissures in the enamel which catch on light probing but do not have detectable softened floor, undermined enamel or softened walls; • dark, shiny, hard, pitted areas showing signs of enamel defect. |
| 3. | Caries | <p>A tooth is deemed to be carious if</p> <ul style="list-style-type: none"> • there is a lesion in a pit or fissure, or a smooth tooth surface, which has a detectable softened floor, softened wall or undermined enamel; or • there is a discoloration due to underlying caries (clinical judgement); or • it has a temporary filling or a dressing; or • it has a partially or fully dislodged filling with signs of secondary caries. |
| 4. | Failed fissure sealed tooth | A tooth that has developed caries on any surface after placement of fissure sealant. Check for softened areas, discoloration and undermined enamel. |
| 5. | Intact fissure sealant | No discontinuity can be detected with a probe (Probe 9) between the margins of the fissure sealant and the occlusal surface of the tooth. |
| 6. | Not intact fissure sealant | Sealant not in place but does not require a redo according to operator's clinical judgement |
| 7. | Redo/replace fissure sealant | <p>A tooth with a sealant not intact/partially lost and according to operator's clinical judgement is at risk to caries.</p> <p>Any child with a redo sealant will be a new case for the year</p> |
| 8. | Wet layer | Refers to the remnant unpolymerised layer after sealant polymerisation. |

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