REDUCING THE PERCENTAGE OF FISSURE-FILLED TEETH FAILURE AMONG PRIMARY SCHOOLCHILDREN IN PERLIS

Bahagian Kesihatan Pergigian
Jabatan Kesihatan Negeri Perlis

NMRR ID-22-01475-BJI

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PROBLEM LIST

1. Low knowledge on x-ray taken among staff at primary dental clinics in Perlis.
2. High failure percentage of fissure-filled teeth among primary schoolchildren in Perlis.
3. Poor quality of clinical record keeping at primary dental clinics in Perlis.
4. Low percentage of new attendance of antenatal patient in primary dental clinics in Perlis.
5. High failure attendance rate of patient scheduled for wisdom teeth removal.
6. Low compliance of infection control practice among staff in Primary Dental Clinics in Perlis.

SMART CRITERIA

Problems	S	M	A	R	T	TOTAL
Low knowledge on x-ray taken among the auxiliaries staff at primary dental clinics in Perlis.	15	15	17	18	17	82
Poor quality of clinical record keeping at Klinik Pergigian Kangar.	18	20	20	21	23	102
High failure percentage of fissure-filled teeth among primary schoolchildren in Perlis.	27	27	27	26	25	132

Rating Scale : 1= Low 2=Medium 3= High 9 Group Members

PROBLEM TO BE STUDIED:

“

High percentage of fissure-filled teeth failure among primary schoolchildren in Perlis

”

REASON FOR SELECTION

S Failure of fissure sealant may lead to caries formation that needs more invasive treatment (root canal treatment, vital pulp therapy) or worst, tooth loss. In 2018, only **15.6%** of fissure-filled teeth were retained in 6 months post-application among Perlis primary schoolchildren.

M Based on patients card record (LP8) and clinical oral examination.

A Proposed interventions can maximize fissure sealant retention thus maintaining its preventive action against caries (dental core business).

R Failure of fissure sealant can be minimized by multiple intervention planned.

T Overall study and interventions can be done within a reasonable time without any issues arise that may affect the success of the study.

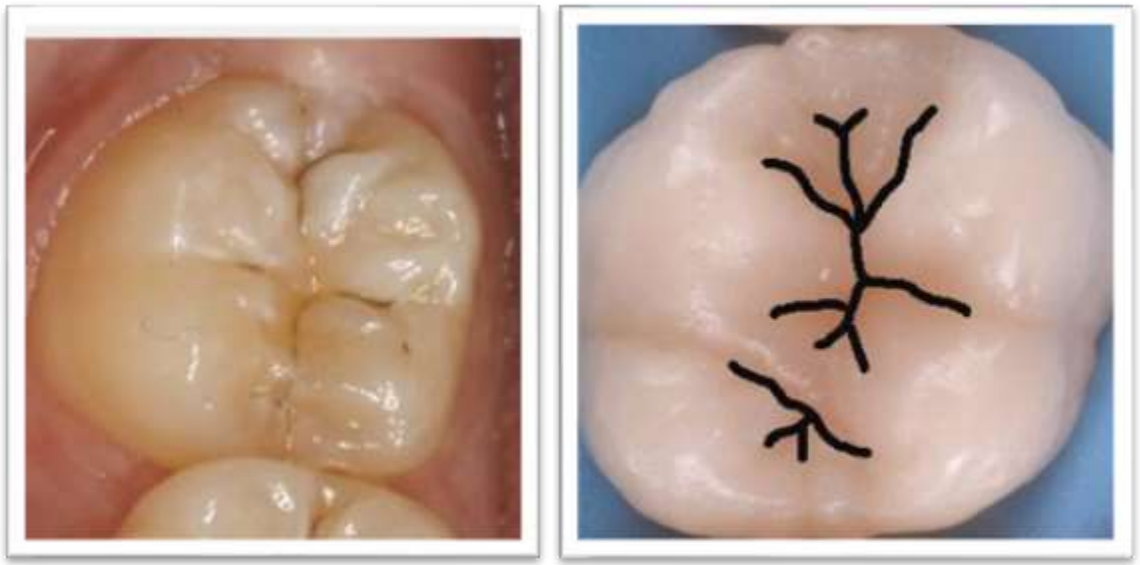
DEFINITION

WHAT IS TOOTH FISSURE?

Anatomical pattern of tooth biting surface.

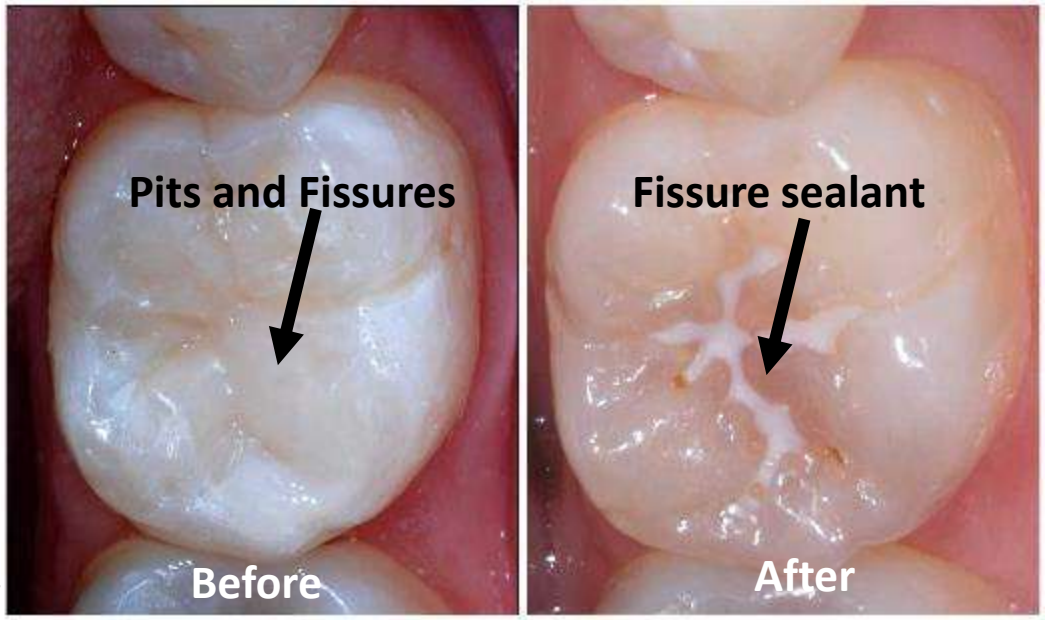
May have deep grooves or shallow grooves.

These grooves are known as pits and fissures.



Pits and Fissures

WHAT IS FISSURE SEALANT?



Material that is applied on the tooth surface as a **protective layer** to prevent the development of dental caries.

FISSURE SEALANT VS FILLING

Fissure sealant is NOT dental filling

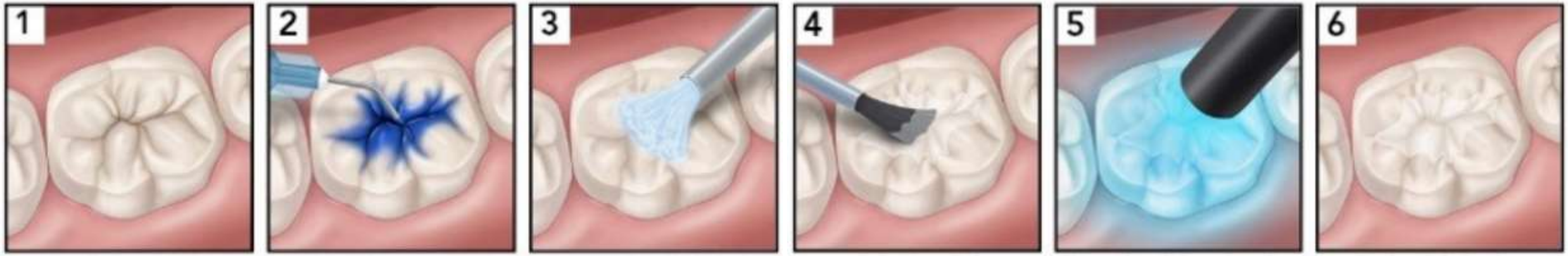
FISSURE SEALANT	FILLING
Preventive measure	Restorative
Prevents decay	Restore decayed tooth to gain normal function

TERMS AND TERMINOLOGY

Terms	Definition
Fissure-filled tooth	Tooth sealed with fissure sealant
Failure/Dislodged of fissure-filled tooth	**Partial or complete loss** of fissure sealant
Tooth isolation	Tooth moisture control action against fluid (saliva/blood)

ROUTINE PROCESS OF SEALANT APPLICATION

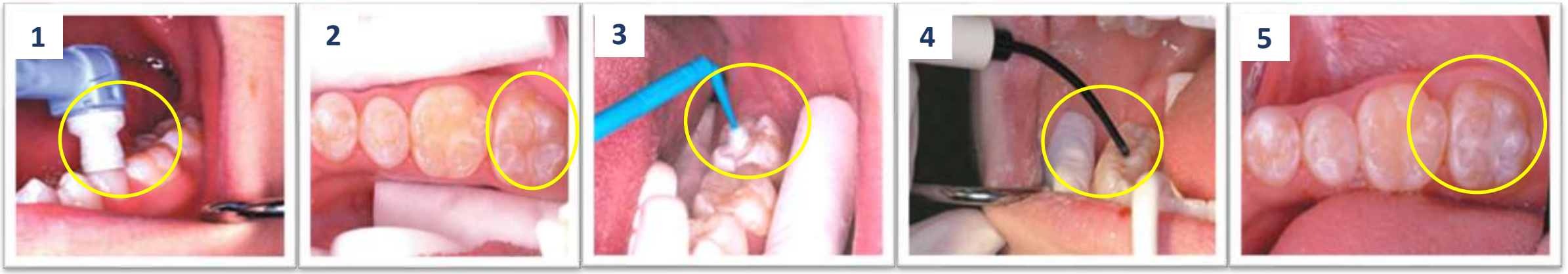
1. Resin Based Fissure Sealant



Tooth without sealant	Etching solution applied	Tooth is cleaned and dried	Sealant is placed	Sealant is cured using light	Tooth with sealant

ROUTINE PROCESS OF SEALANT APPLICATION

2. Glass Ionomer Based Fissure Sealant



Tooth prophylaxis

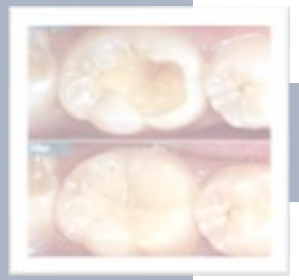
Isolation for moisture control

Conditioner application

GI sealant application

Completely filled fissure

What Happened

		TOTAL ESTIMATED TREATMENT PRICE
	RESTORATION Cost of Material : RM 25 / Tooth	RM 100-200 / Tooth *Actual Price : RM 40.00
	ROOT CANAL TREATMENT	RM 800-1200 / Tooth

"AN OUNCE OF PREVENTION IS WORTH A POUND OF CURE"

Preventive measure

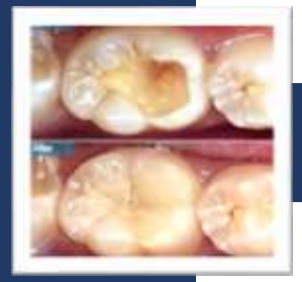
	DENTURE	RM 130 / Tooth *Actual Price : RM 100.00
	FISSURE SEALANT Cost of Material : RM 5 / Tooth	RM 60 / Tooth *Actual Price : RM15.00

Actual Price : Goverment Charge Based On *Akta Fi 2017 (Perubatan)*

What Happened If Fissure Sealant Failed ?

CARIES

Preventive measure

		TOTAL ESTIMATED TREATMENT PRICE
	**RESTORATION** Cost of Material : RM 25 / Tooth	**RM 100-200 / Tooth** *Actual Price : RM 40.00
	**ROOT CANAL TREATMANT**	**RM 800-1200 / Tooth** *Actual Price : RM 150.00
	**EXTRACTION**	**RM 800-1200 / Tooth** *Actual Price : RM 25.00
	**DENTURE**	**RM 130 / Tooth** *Actual Price : RM 100.00
	**FISSURE SEALANT** Cost of Material : RM 5 / Tooth	**RM 60 / Tooth** *Actual Price : RM15.00 Actual Price : Goverment Charge Based On *Akta Fi 2017 (Perubatan)*

LITERATURE REVIEWS

Kumaran P, 2013	Most critical period for sealant failure is at baseline and during the **6 months** following application.
Azarpazhooh A, 2008	One of the main reasons for the early loss of fissure sealant is the **contamination of the tooth surface with saliva during application.**
American Academy of Paediatric Dentistry (AAPD), 2002	Consensus reported that retention rate of fissure sealant in **6 months** were **85%** with failure rate of 4% occurred at each following subsequent 6 months.

INTRODUCTION

Targeted goal of Mulut Bebas Karies (MBK) in Malaysia is **70%** for the 12 years old children.

(Malaysia's National Oral Health Plan 2011-2020)

BUT

Percentage of Mulut Bebas Karies (MBK) 6 years old in Perlis is way behind standard :

Jan- Dec 2016 : 1225/3963 = 30.9%

Jan- Dec 2017 : 1307/3899 = 33.5%

Jan- Dec 2018 : 1327/3955 = 33.6%

Jan- Dec 2019 : 1438/3996 = 35.9%

Jan- Dec 2020 : 1367/3601 = 37.9%

(National Standard $\geq$ 50%)

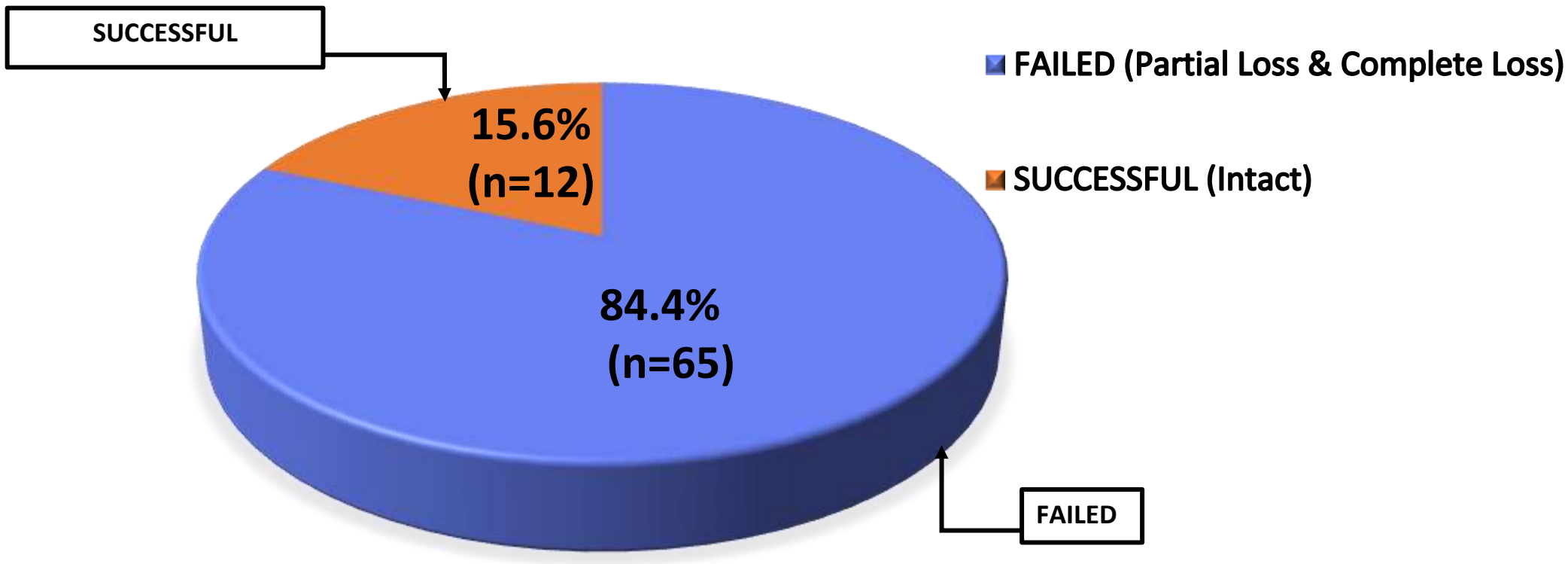
WHY IT HAPPEN?

Primary schoolchildren :
Unable to brush teeth properly.

WHY PREVENTIVE TREATMENT?

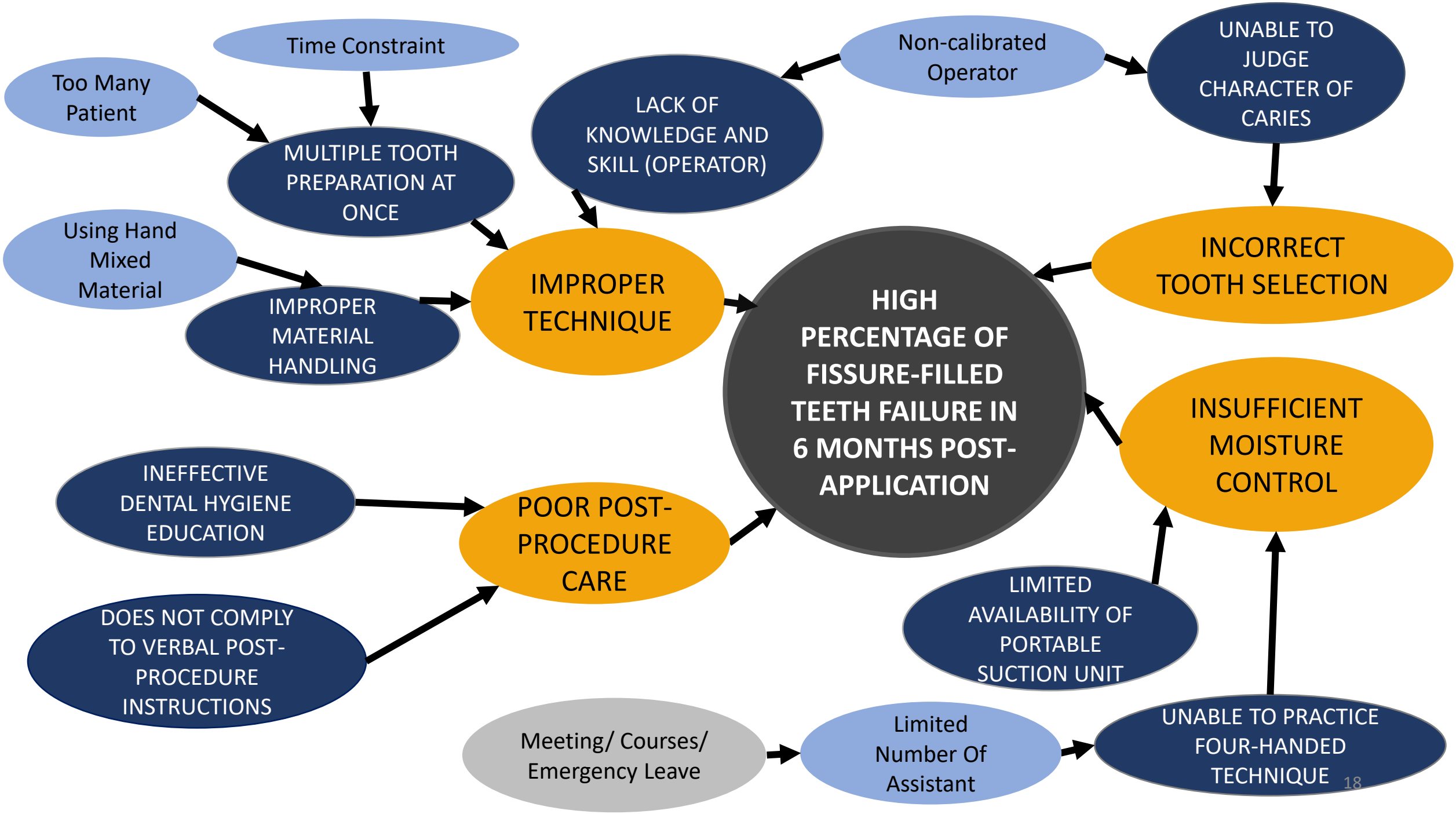
One of the effective way to prevent dental caries is fissure sealant.

PROBLEM VERIFICATION



PROBLEM ANALYSIS

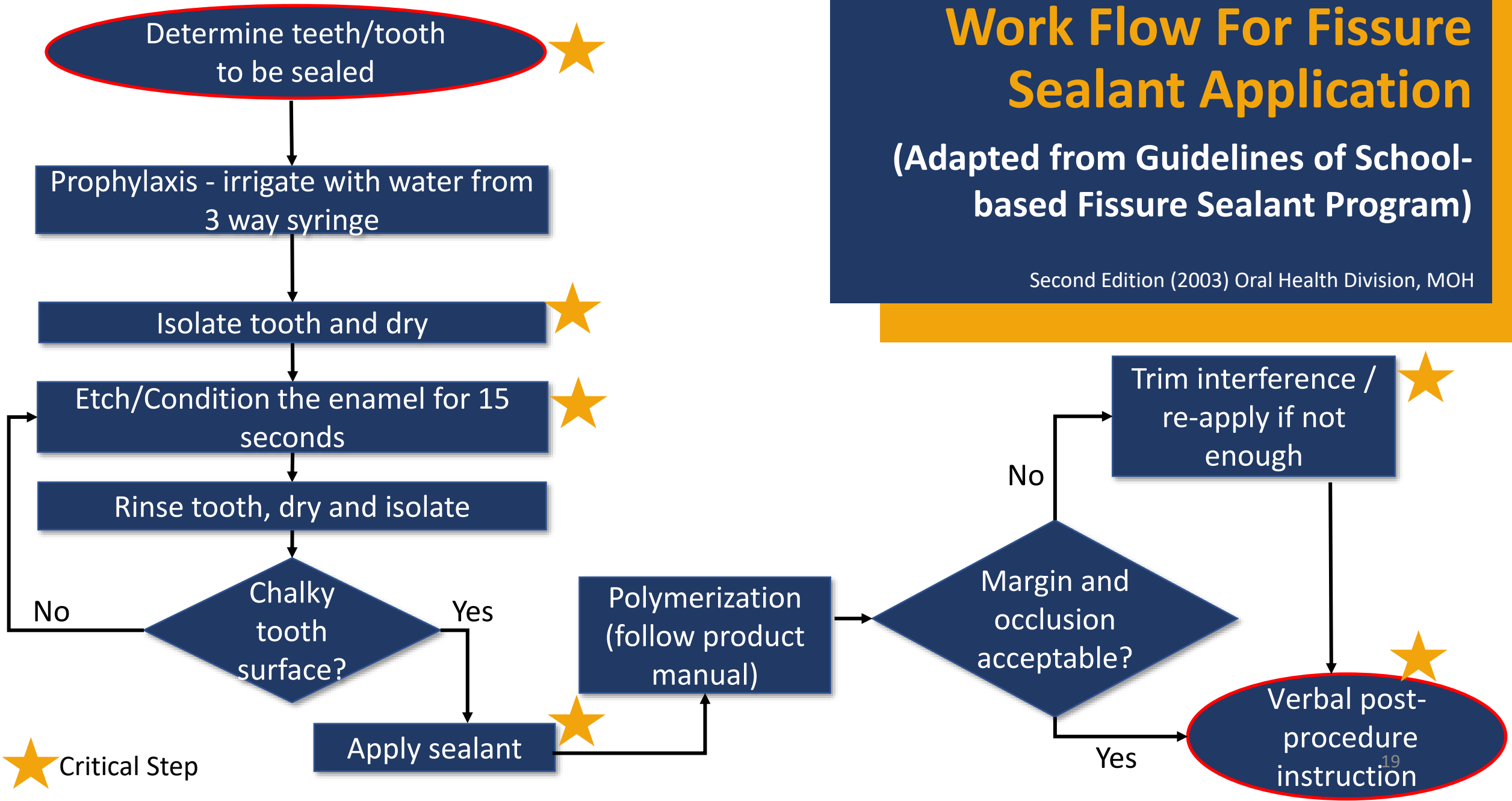
PROBLEM	High percentage of fissure-filled teeth failure among primary schoolchildren in Perlis
WHAT	Patient with failed fissure-filled teeth
WHERE	Selected primary school in Perlis
WHEN	6 months after fissure sealant application
WHO	Personnel involved in the process : Dental Therapist, Dental Surgery Assistant and *Pembantu Perawatan Kesihatan*
WHY	Improper technique, incorrect tooth selection, insufficient moisture control and improper post-procedure care
HOW	Guidelines for Fissure Sealant Application is available but the percentage of patient with failed fissure-filled teeth remains high


Time Constraint
Too Many Patient
MULTIPLE TOOTH PREPARATION AT ONCE
LACK OF KNOWLEDGE AND SKILL (OPERATOR)
Non-calibrated Operator
UNABLE TO JUDGE CHARACTER OF CARIES
Using Hand Mixed Material
IMPROPER MATERIAL HANDLING
IMPROPER TECHNIQUE
INCORRECT TOOTH SELECTION
HIGH PERCENTAGE OF FISSURE-FILLED TEETH FAILURE IN 6 MONTHS POST-APPLICATION
INSUFFICIENT MOISTURE CONTROL
INEFFECTIVE DENTAL HYGIENE EDUCATION
POOR POST-PROCEDURE CARE
DOES NOT COMPLY TO VERBAL POST-PROCEDURE INSTRUCTIONS
LIMITED AVAILABILITY OF PORTABLE SUCTION UNIT
Meeting/ Courses/ Emergency Leave
Limited Number Of Assistant
UNABLE TO PRACTICE FOUR-HANDED TECHNIQUE

Work Flow For Fissure Sealant Application

(Adapted from Guidelines of School-based Fissure Sealant Program)

Second Edition (2003) Oral Health Division, MOH



PROBLEM STATEMENT

PROBLEM	Verification study conducted in the period of January to June 2018 showed that 84.4% of previously fissure-filled teeth were failed in 6 months post-application
EFFECT	Failed fissure-filled tooth will creates environment conducive to caries, thus affecting tooth function by causing cavity that will cause episodes of oral discomfort and pain.
POSSIBLE CAUSE	Multiple factors including improper work practice among staff, incorrect tooth selection, insufficient moisture control and poor post-procedure care contributed to this problem.
AIM OF THE STUDY	This study will reduce the percentage of failure of fissure- filled teeth in 6 months post-application among primary schoolchildren in Perlis.

PROBLEM STATEMENT

Verification study conducted in the period of January to Jun 2018 showed that 84.4% of previously fissure-filled teeth were failed in 6 months post-application.

Failed fissure-filled teeth will creates environment conducive to caries, thus affecting tooth function by causing cavity that will cause episodes of oral discomfort and pain.

Multiple factors including improper work practice among staff, incorrect tooth selection, insufficient moisture control and poor post-procedure care contributed to this problem.

This study will reduce the percentage of failure of fissure- filled teeth among primary schoolchildren in Perlis.

GENERAL OBJECTIVE

To reduce the percentage of fissure-filled teeth failure in 6 months post-application among schoolchildren in Perlis.

SPECIFIC OBJECTIVE

- To measure the percentage of fissure-filled teeth failure in 6 months post-application among primary schoolchildren in Perlis.
- To determine the possible causes that contributes to the failure of fissure-filled teeth.
- To identify and formulate measures to reduce percentage of failure of fissure-filled teeth.
- To evaluate the effectiveness and the sustainability of the remedial measures .

INDICATOR AND STANDARD

INDICATOR Percentage of fissure-filled teeth failure in 6 months post-application

FORMULA

$$\frac{\text{Total number of failed fissure-filled teeth in 6 months post-application}}{\text{Total number of fissure-filled teeth}} \times 100\ \%$$

STANDARD

Standard ≤ 15%

(consensus American Association of Paediatric Dentistry 2002)

MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard
1.	Examination and diagnosis	Operator trained in Modified MOH International Caries Detection And Assessment System (ICDAS) Charting (MMI)	100%
2.	Determination of tooth to be sealed with fissure sealant	Fully erupted tooth	100%
		Tooth should be free of caries	100%
		Tooth with complex, deep fissure	100%
3.	Availability of material and instrument needed for fissure sealant procedure	Fissure Sealant Checklist in patient's card record (LP.8) to guide operator before, during and after procedure	100%

MODEL OF GOOD CARE

Steps	Process of care	Criteria	Standard
4.	Tooth isolation	Isolation with cotton roll with saliva ejector (portable suction)	100%
		Availability of assistant to help with moisture control and material handling	100%
5.	Application of dentin conditioner / etching / light cure	Follow product manual	100%
		One tooth preparation at a time	100%
6.	Contact between tooth after fissure sealant application	Ensure no bite interference with articulating paper	100%
7.	Post-procedure instruction	Written post-procedure instruction given to patient for more clear instruction	100%
8.	Review post-procedure	Tooth sealed with fissure sealant reviewed in 6 months post-application	100%

PROCESS OF GATHERING INFORMATION

INCLUSION CRITERIA

All primary schoolchildren received incremental dental treatment at school in Perlis.

EXCLUSION CRITERIA

- Partially erupted tooth
- Patient without consent
- Deciduous tooth
- Non-compliance patient
- Tooth with dentinal caries
- Tooth with restoration

STUDY METHODOLOGY

QUALITY IMPROVEMENT PROJECT

Study Design:
Cross Sectional Study

Sampling Technique:
Cluster Sampling

Study Instruments:
Audit Form, Knowledge Attitude Practice (KAP) Questionnaire, Patient's record

VERIFICATION STUDY

Retrospective Cohort Study
- Duration : January 2018- June 2018
- Sample size : 77 tooth from 36 Students
- Place : Sekolah Kebangsaan Putra

STRATEGIES FOR CHANGE (CYCLE 1)
(July 2018 – September 2018)

REEVALUATION 1

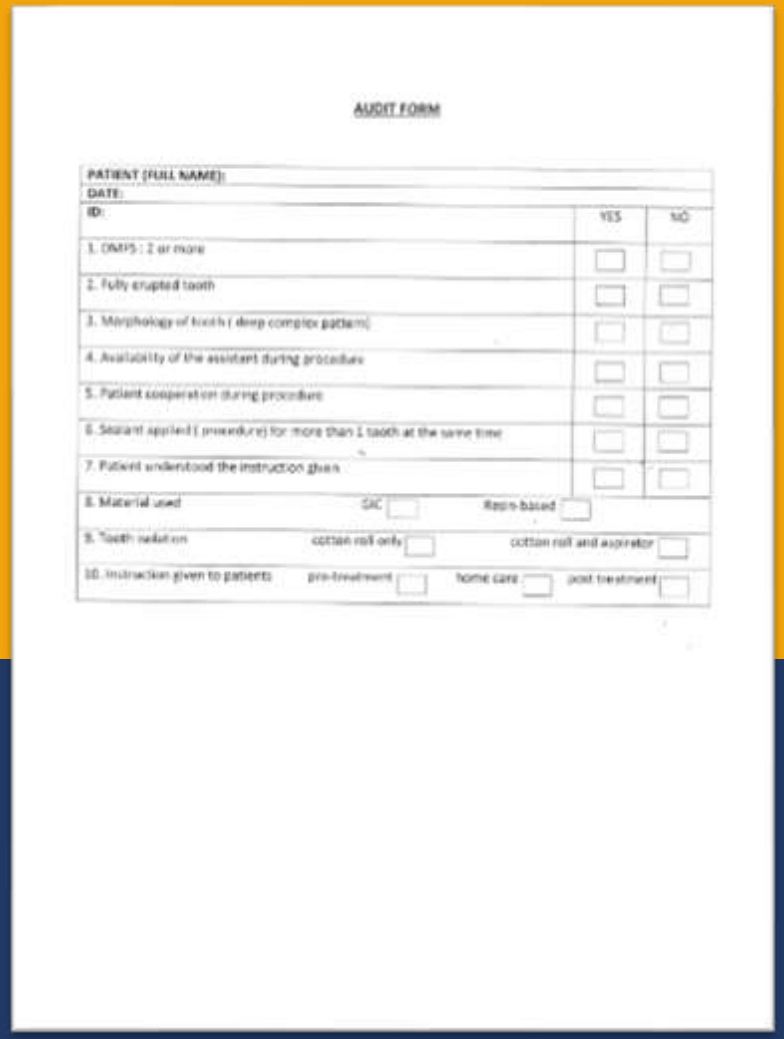
Reevaluation 1
Prospective Cohort Study
- Duration : January 2019- June 2019
- Sample size : 51 tooth from 37 Students
- Place : 7 Selected Primary Schools

STRATEGIES FOR CHANGE (CYCLE 2)
(January 2020 – March 2020)

REEVALUATION 2

Reevaluation 2
Prospective Cohort Study
- Duration : September 2020-December 2020
- Sample size : 37 tooth from 24 Students
- Place : 16 Selected Primary Schools

AUDIT FORM



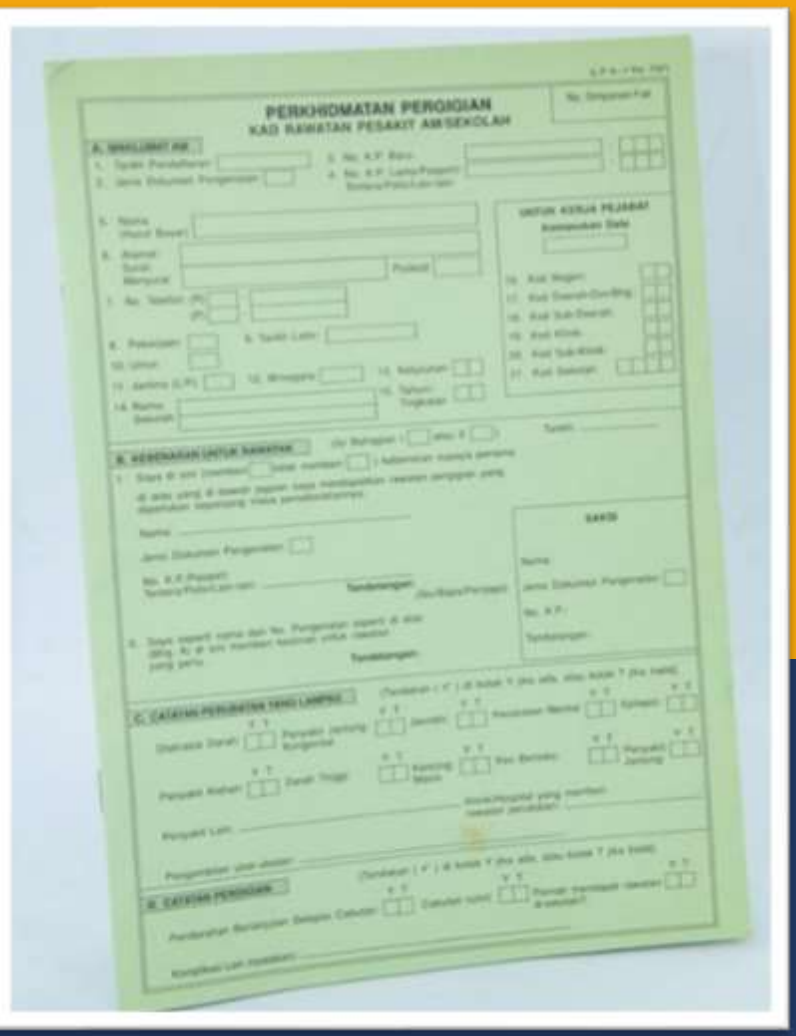
AUDIT FORM

PATIENT (FULL NAME):

DATE:

ID:	YES	NO
1. OMPS : 2 or more		
2. Fully erupted tooth		
3. Morphology of tooth (deep complex pattern)		
4. Availability of the assistant during procedure		
5. Patient cooperation during procedure		
6. Sealant applied (procedure) for more than 1 tooth at the same time		
7. Patient understood the instruction given		
8. Material used GIC ☐ Resin-based ☐		
9. Tooth isolation cotton roll only ☐ cotton roll and aspirator ☐		
10. Instruction given to patients pre-treatment ☐ home care ☐ post treatment ☐		

PATIENT'S RECORD



PERKHIDMATAN PERGIGIAN
KAD RAWATAN PESAKIT AM SEKOLAH

QUESTIONNAIRE

Questionnaire : To Assess Knowledge, Attitude and Practice of Dental Nurses in Perlis Regarding Fissure Sealant Procedure

Umur: _____

Pengalaman bekerja sebagai Jururawati Pergigian (Tahun) _____

Knowledge

1. Adakah penggunaan suction penting dalam aplikasi sealan fisur?
   a) Ya
   b) Tidak
2. Sebelum sealan fisur diaplikasi pada gigi sepatutnya tumbuh?
   a) Ya
   b) Tidak
3. Sesi pemeriksaan sealan fisur harus dilihat semula (review) selepas aplikasi
   a) Ya
   b) Tidak
4. Saya percaya penilaian risiko karies penting dalam menentukan kriteria gigi yang perlu dibuat sealan fisur
   a) Ya
   b) Tidak
5. Pemilihan gigi yang sesuai penting dalam memastikan kebolehtahanan sealan fisur
   a) Ya
   b) Tidak
6. Teknik yang betul dalam mengaplikasikan sealan fisur adalah aspek penting dalam menentukan kualiti sealan fisur
   a) Ya
   b) Tidak

Practice

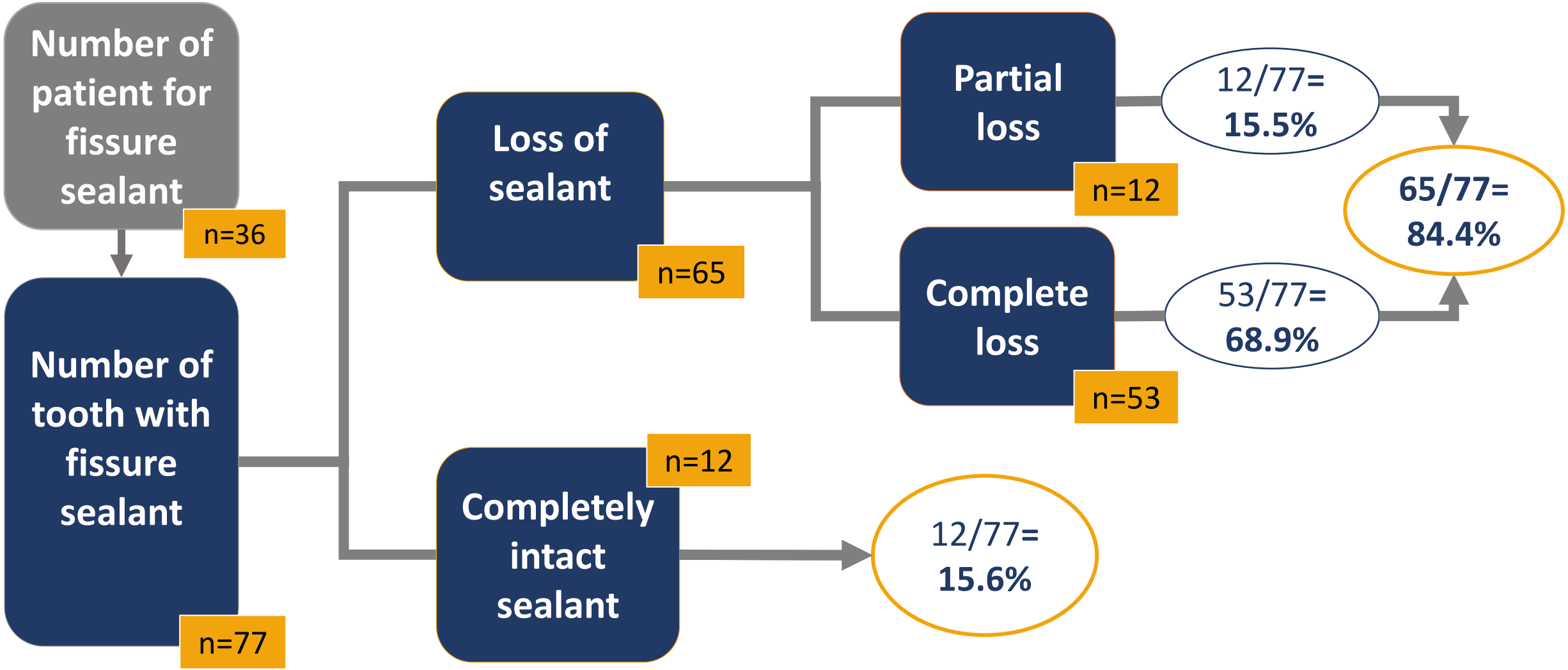
1. Adakah anda menggunakan penyedut air liur (suction) dalam proses aplikasi sealan fisur?
   a) Ya
   b) Tidak
2. Adakah anda memantau cara pembantu membancuh Glass Ionomer Cement (GIC) untuk kegunaan sealan fisur?
   a) Ya
   b) Tidak
3. Etching sebelum aplikasi sealan fisur adalah selama 5-10 saat
   a) Ya
   b) Tidak
4. Adakah bancuhan Glass Ionomer Cement (GIC) untuk sealan fisur adalah 2:1
   a) Ya

STUDY INSTRUMENT

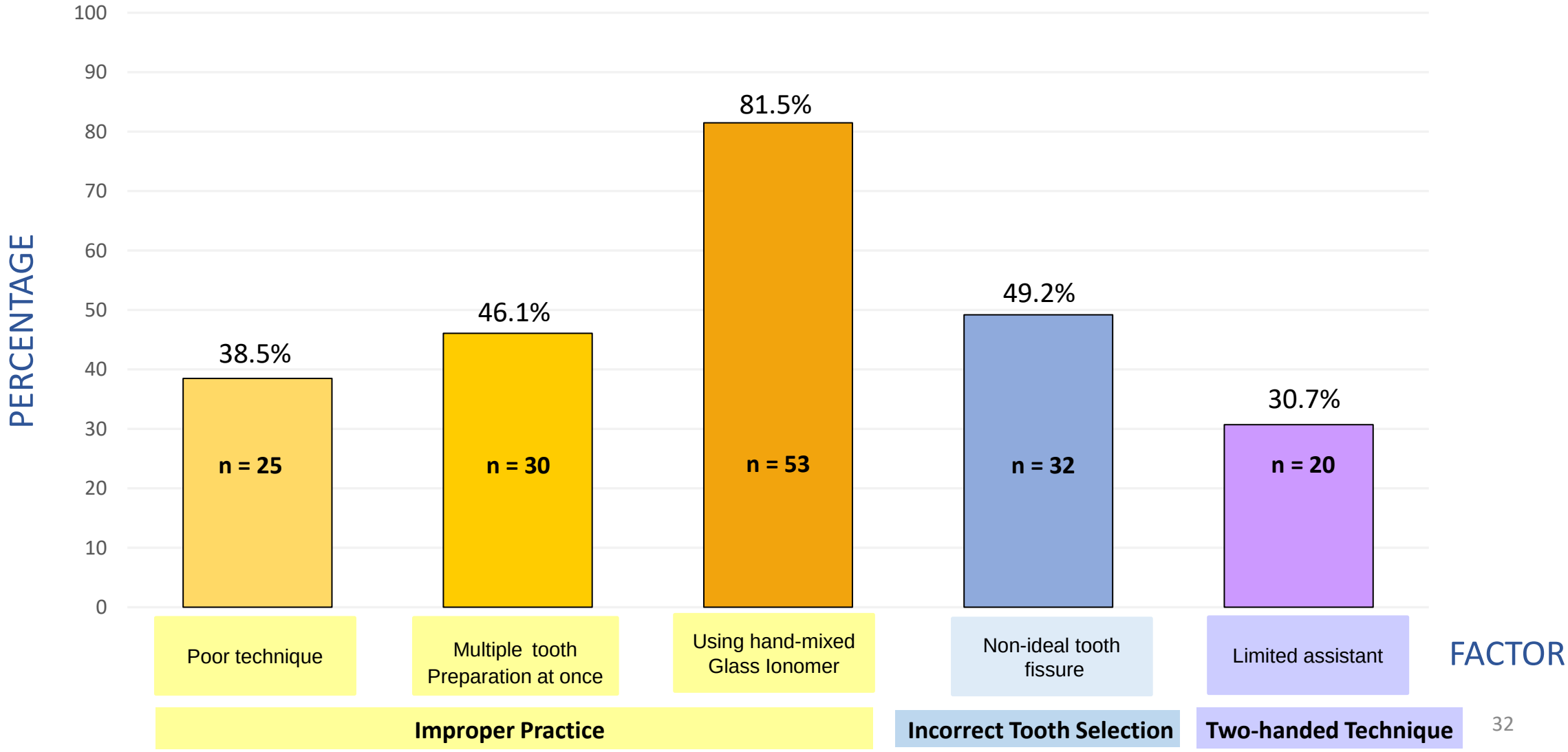
ANALYSIS & INTERPRETATION

(VERIFICATION STUDY)

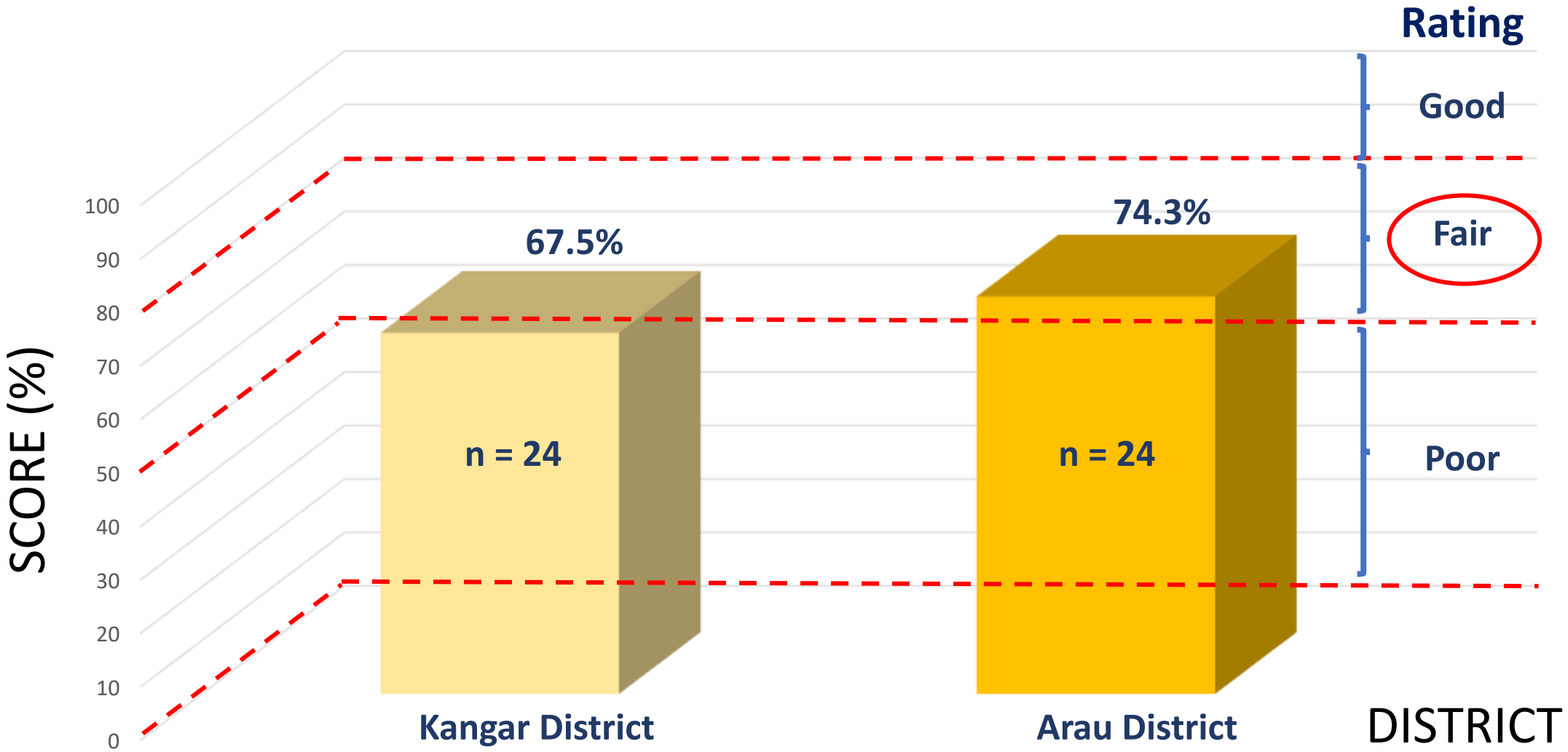
VERIFICATION STUDY FINDINGS



PERCENTAGE OF FACTOR CAUSING THE FAILURE OF FISSURE-FILLED TEETH (total sample = 65)



KNOWLEDGE SURVEY ANALYSIS (n=48)



MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard	Verification
1.	Examination and diagnosis	Operator trained in Modified MOH International Caries Detection And Assessment System (ICDAS) Charting (MMI)	100%	40%
2.	Determination of tooth to be sealed with fissure sealant	Fully erupted tooth	100%	100%
		Tooth should be free of caries	100%	100%
		Tooth with complex, deep fissure	100%	49%

MODEL OF GOOD CARE

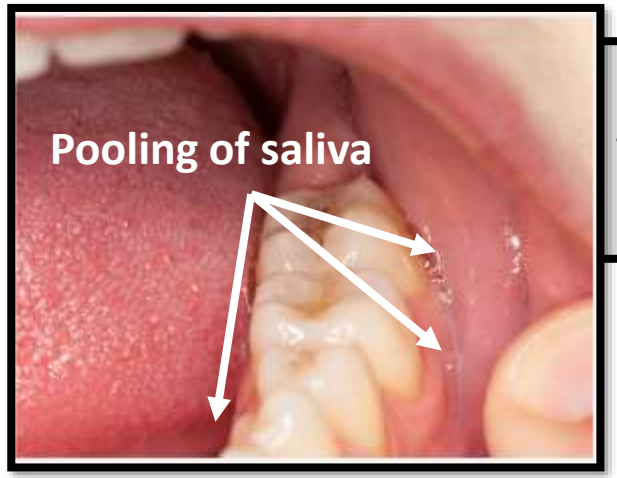
Step	Process of care	Criteria	Standard	Verification
3.	Availability of material and instrument needed for fissure sealant procedure	Fissure Sealant Checklist in patient's card record (LP.8) to guide operator before, during and after procedure	100%	0%
4.	Tooth isolation	Isolation with cotton roll with saliva ejector (portable suction)	100%	31%
		Availability of assistant to help with moisture control and material handling	100%	31%
5.	Application of dentin conditioner / etching / light cure	Follow product manual	100%	38%
		One tooth preparation at a time	100%	46%

MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard	Verification
6.	Contact between tooth after fissure sealant application	Ensure no bite interference with articulating paper	100%	100%
7	Post-procedure instruction	Written post-procedure instruction given to patient for more clear instruction	100%	0%
8.	Review post-procedure	Tooth sealed with fissure sealant reviewed in 6 months post-application	100%	100%

VERIFICATION STUDY

HOW IT LOOKS LIKE IN VERIFICATION STUDY

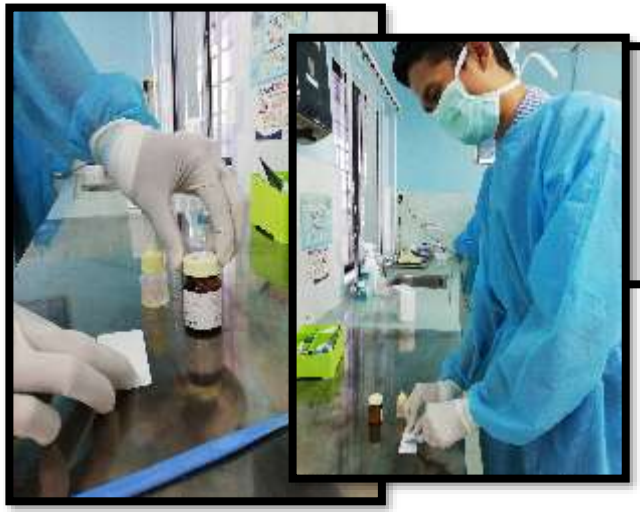


Improper isolation technique leads to insufficient moisture control.
30.8% (n= 20/65)

Two-handed Technique where assistant is unavailable to assist Dental Therapist in moisture and material control.
30.8% (n= 20/65)

Does not follow product manual where conditioner is not used during Glass Ionomer-based fissure sealant application, thus leads to improper tooth surface preparation.
38.5% (n= 25/65)

HOW IT LOOKS LIKE IN VERIFICATION STUDY



Use of hand-mixed Glass Ionomer Cement (GIC) which is prone to material inconsistency.

81.5% (n= 53/65)

Multiple tooth preparation at once without proper isolation, where operators did the procedure on more than 1 tooth at the same time.

49.2% (n= 32/65)

Incorrect tooth selection where non-suitable tooth fissure morphology is placed with sealant.

49.2% (n= 32/65)

STRATEGIES FOR CHANGE (INTERVENTION)

CYCLE 1

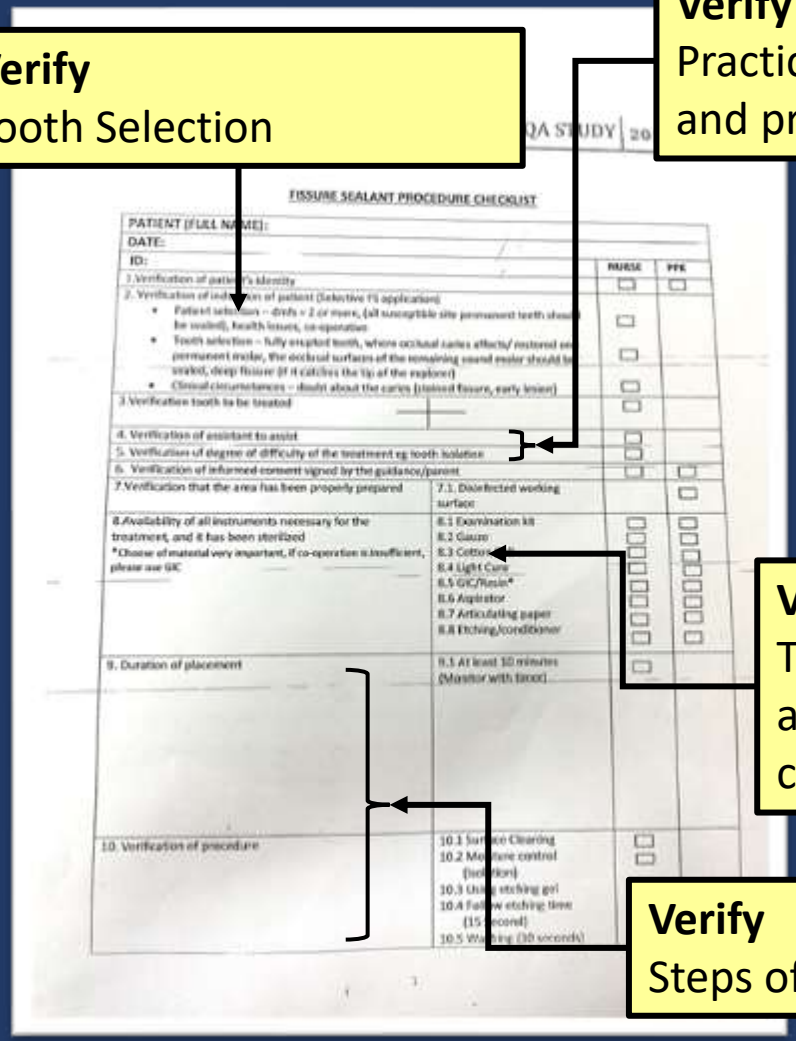
STRATEGIES FOR CHANGE CYCLE 1

Problem	Action
Unclear SOP and references	Improvise SOP and circulate among operators in Perlis
	Create Fissure Sealant Procedure Checklist
Unspecific dental charting	Implement the use of Modified-MOH ICDAS Dental Charting
Inconsistency of material handling	Substitute hand-mixed GI with capsulated GI
Inadequate skill and awareness among operator	Conduct Continuous Dental Education (CDE)
	Provide chair-side guidance and hands-on among operators
	Calibrate and privileging each operator through courses
Unable to achieve good moisture control during procedure	Implement four-handed dentistry
Poor post-procedure care	Provide chair-side dental hygiene education
	Create informative written post-procedure instruction

STRATEGY 1 : Fissure Sealant Procedure Checklist

Verify
Tooth Selection

Verify
Practice of 4-handed dentistry and proper tooth isolation



FISSURE SEALANT PROCEDURE CHECKLIST

PATIENT (FULL NAME):
DATE:
ID:

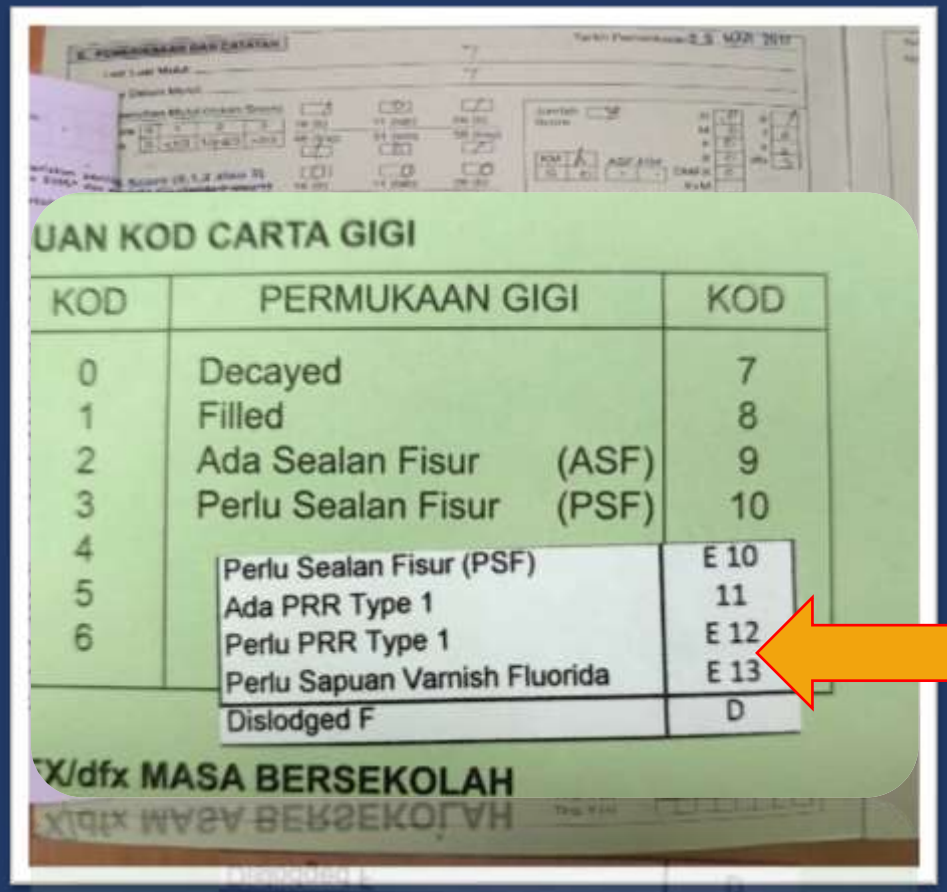
		NURSE	PPK
1.Verification of patient's identity			
2. Verification of indication of patient (Selective 1% application)			
3.Verification tooth to be treated			
4. Verification of assistant to assist			
5. Verification of degree of difficulty of the treatment eg tooth isolation			
6. Verification of informed consent signed by the guidance/parent			
7.Verification that the area has been properly prepared	7.1. Disinfected working surface		
8.Availability of all instruments necessary for the treatment, and it has been sterilized *Choose of material very important, if co-operation is insufficient, please use GIC	8.1 Examination kit 8.2 Gauze 8.3 Cotton 8.4 Light Cure 8.5 GIC/Resin* 8.6 Aspirator 8.7 Articulating paper 8.8 Etching/conditioner		
9. Duration of placement	9.1 At least 10 minutes (Monitor with timer)		
10. Verification of procedure	10.1 Surface Cleaning 10.2 Moisture control (Isolation) 10.3 Using etching gel 10.4 Follow etching time (15 second) 10.5 Washing (30 seconds)		

Verify
Type of material used according to patient's cooperation

Verify
Steps of sealant application

As reference for every operator before and during fissure sealant procedure.

STRATEGY 2 : Modified-MOH ICDAS Dental Charting



- Modified-MOH International Caries Detection & Assessment System **(MM- ICDAS) dental charting** used.
- All Dental Therapist involved were calibrated (privileged) in ICDAS starting July 2018 onwards.
- More specific dental charting for any preventive step/ treatment listed, including fissure sealant.

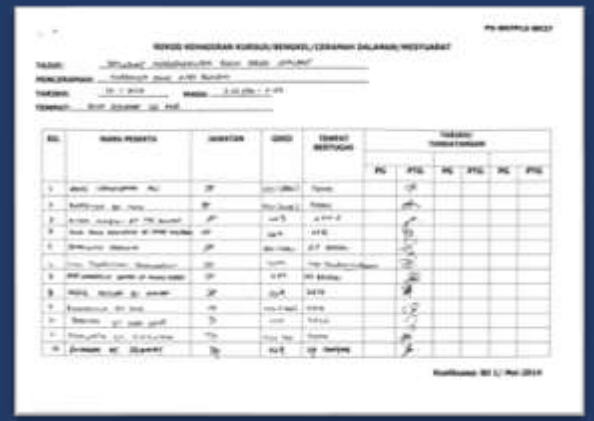
STRATEGY 3 : Capsulated Glass Ionomer (GI)

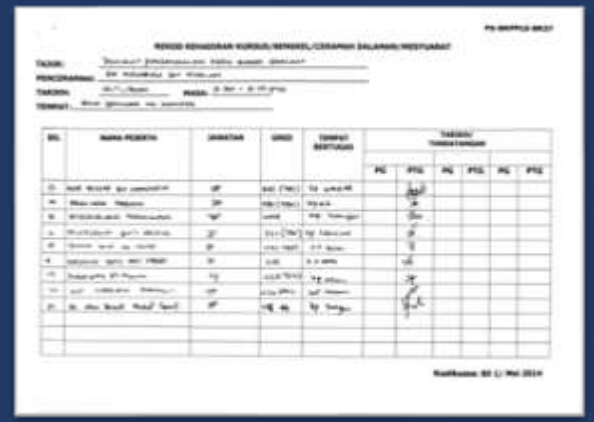
Types	Price (1 set)	Estimated Usage	Cost Per Teeth	Advantage
Capsulated GI	RM460	100 Teeth	RM4.60	**No Human Error**
Hand-mixed GI	RM175	40 Teeth	RM4.38	-

Slight Cost Difference

- Substitute the use of hand-mixed Glass Ionomer (GI) based sealant to **Capsulated GI,** if GI-based sealant is preferred by the operator.
- Hand-mixed GI based sealant tend to differ in consistency depending on the operator, later affects retention of fissure sealant on tooth surface.

STRATEGY 4 : Continuous Dental Education (CDE)





Continuous Dental Education (CDE) to update operator knowledge regarding proper techniques for fissure sealant procedure.

STRATEGY 5 : Live Chair-side Guidance and Hands-On

Close monitoring of case selection and proper technique practiced.

STRATEGY 6 : Calibration and Privileging

Calibration (privileging) each operator through courses

STRATEGY 7 : Four-Handed Dentistry

- Make compulsory of the presence of assistant during procedure : Four-handed Dentistry.
- Increase efficiency of procedure performed (isolation, material handling).
- Less stressful to operator and patient.

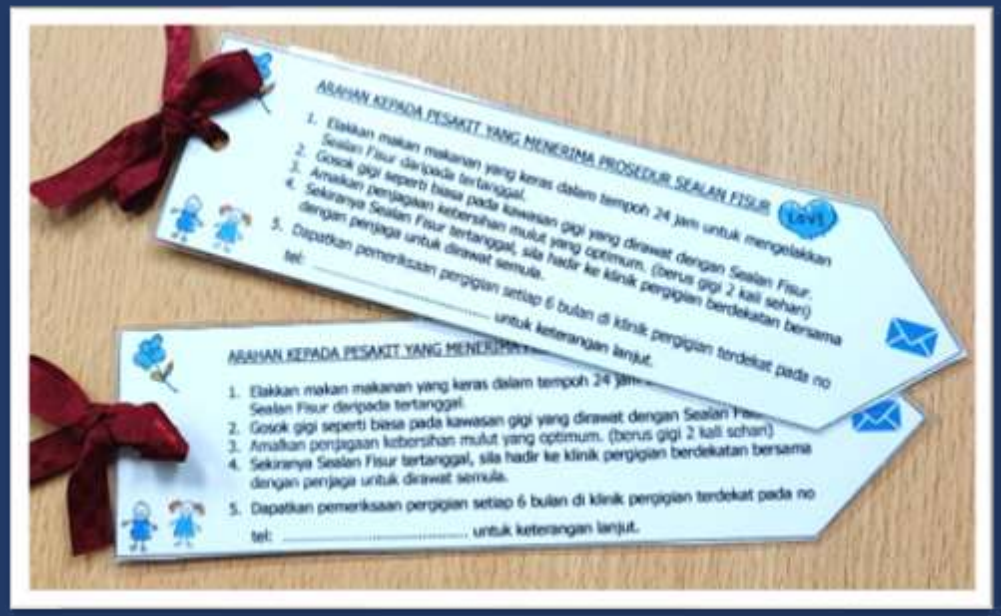
STRATEGY 8 : Patient Education

1

Chair side Dental Hygiene Education

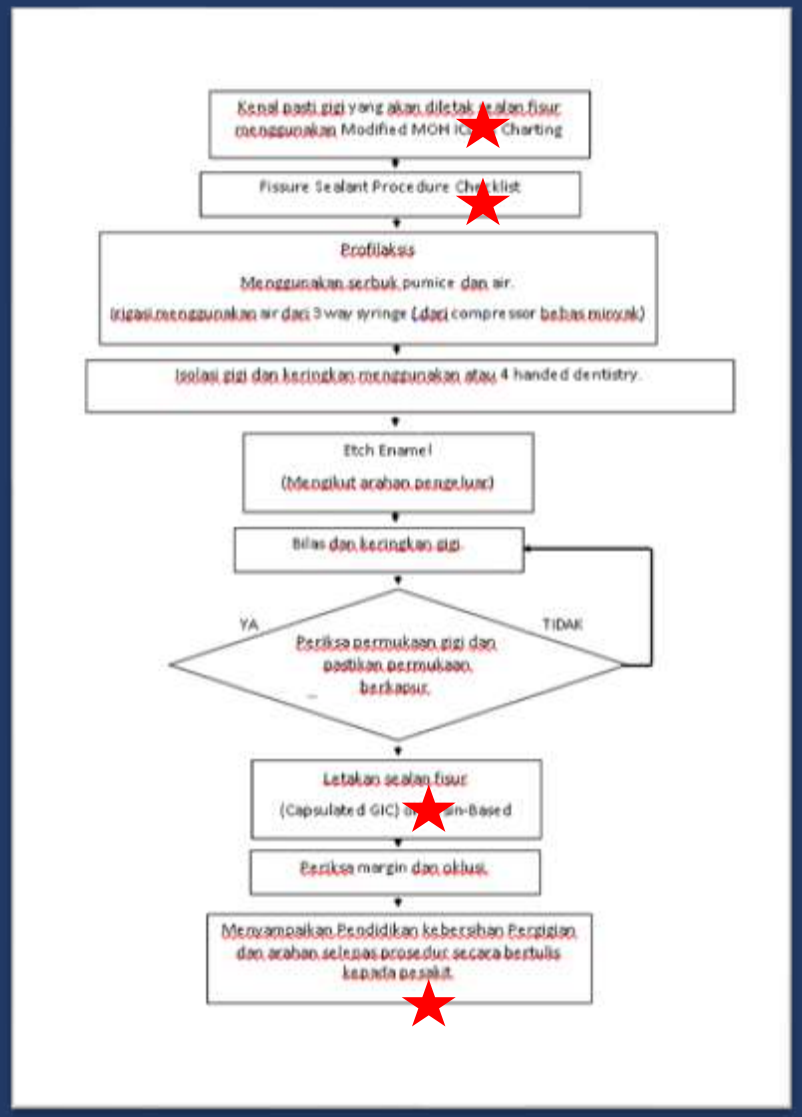
2

Post-procedure Care



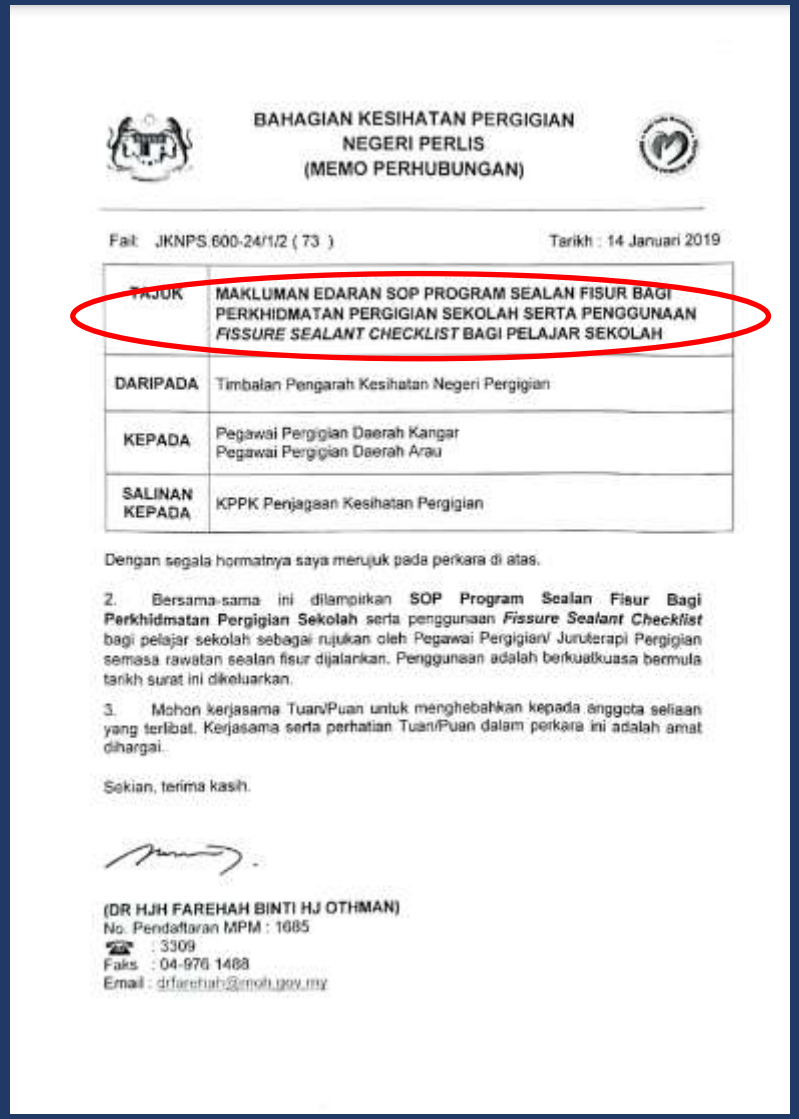
Written post-procedure instruction as a take-home messages to both patient and parents

STRATEGY 9 : IMPROVISED STANDARD OF PROCEDURE (SOP)



Existing Standard of Procedure (SOP) were improvised to emphasize the overall step of fissure sealant procedure

STRATEGY 10 : CIRCULATION OF UPDATED STANDARD OF PROCEDURE (SOP)



BAHAGIAN KESIHATAN PERGIGIAN
NEGERI PERLIS
(MEMO PERHUBUNGAN)

Fail: JKNPS.600-24/1/2 (73) Tarikh : 14 Januari 2019

TAJUK	MAKLUMAN EDARAN SOP PROGRAM SEALAN FISUR BAGI PERKHIDMATAN PERGIGIAN SEKOLAH SERTA PENGGUNAAN *FISSURE SEALANT CHECKLIST* BAGI PELAJAR SEKOLAH
DARIPADA	Timbalan Pengarah Kesihatan Negeri Pergigian
KEPADA	Pegawai Pergigian Daerah Kangar Pegawai Pergigian Daerah Arau
SALINAN KEPADA	KPPK Penjagaan Kesihatan Pergigian

Dengan segala hormatnya saya merujuk pada perkara di atas.

2. Bersama-sama ini dilampirkan **SOP Program Sealan Fisur Bagi Perkhidmatan Pergigian Sekolah** serta penggunaan ***Fissure Sealant Checklist*** bagi pelajar sekolah sebagai rujukan oleh Pegawai Pergigian/ Juruterapi Pergigian semasa rawatan sealan fisur dijalankan. Penggunaan adalah berkuatkuasa bermula tarikh surat ini dikeluarkan.

3. Mohon kerjasama Tuan/Puan untuk menghebahkan kepada anggota seliaan yang terlibat. Kerjasama serta perhatian Tuan/Puan dalam perkara ini adalah amat dihargai.

Sekian, terima kasih.

(DR HJH FAREHAH BINTI HJ OTHMAN)
No. Pendaftaran MPM : 1685
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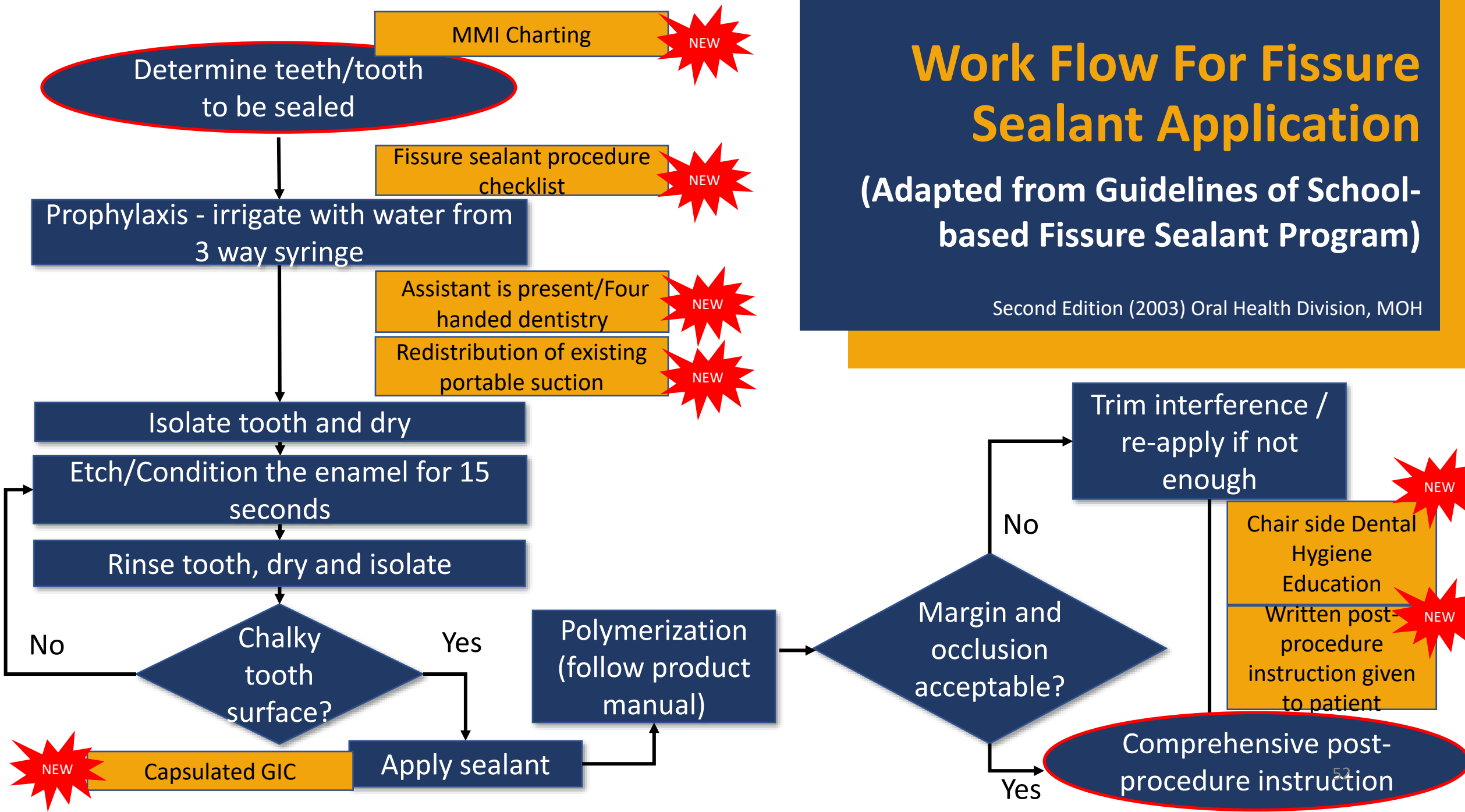
Memo on updated SOP distributed to all dental primary healthcare facilities in Perlis.

Work Flow For Fissure Sealant Application

(Adapted from Guidelines of School-based Fissure Sealant Program)

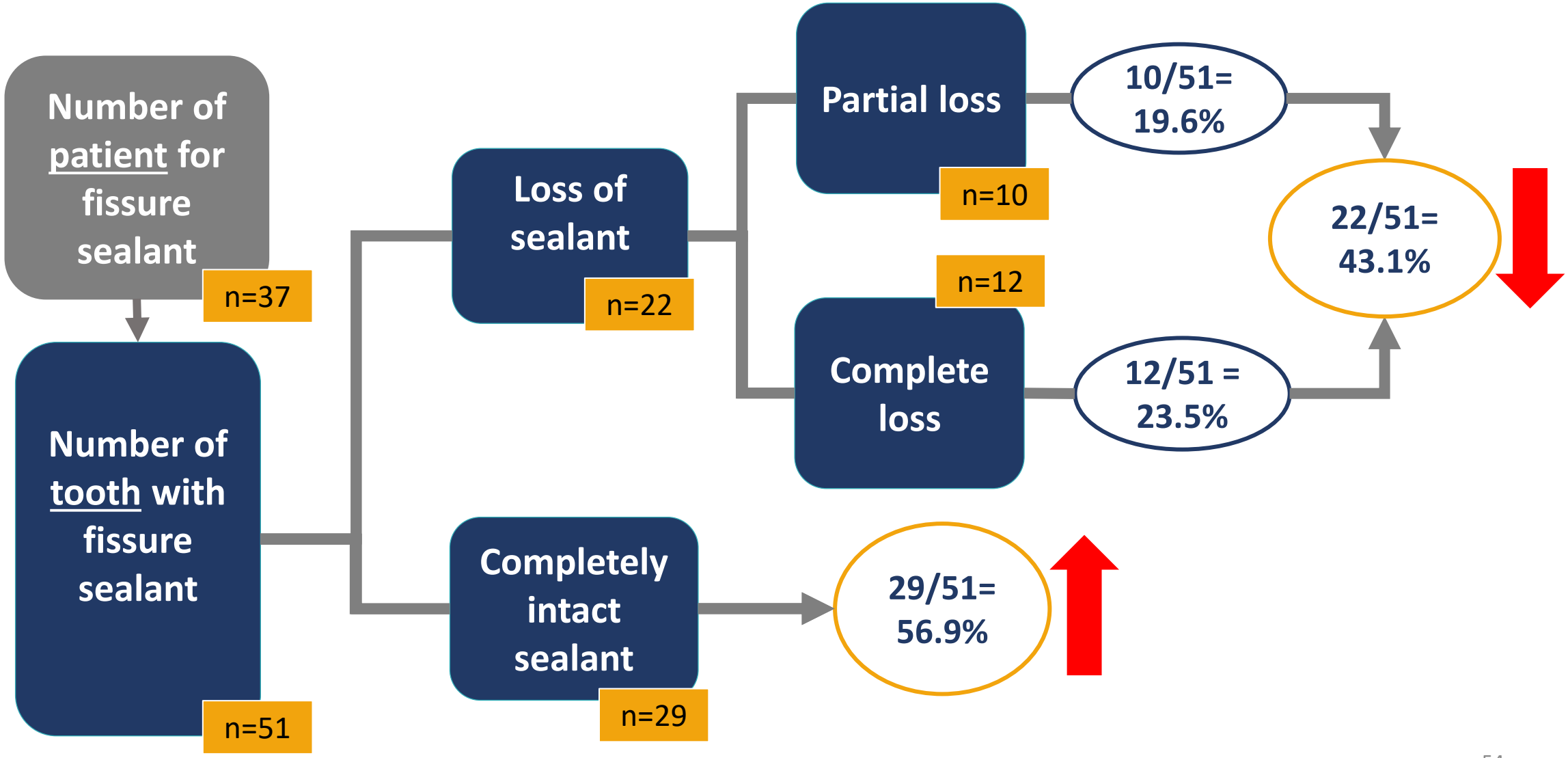
Second Edition (2003) Oral Health Division, MOH



EFFECT OF CHANGE CYCLE 1

- **Aim** : To determine the % of failure fissure- filled in primary schoolchildren
- **Place** : Selected primary schools in Perlis
- **Duration** : January 2019 to June 2019
- **Samples** : 37 students with 51 fissure- filled teeth.
- **Study instruments** :
  - Special forms (MM-ICDAS, Fissure sealant procedure checklist)
  - Questionnaires to Dental Therapist
  - Evaluation of the work process among the staff during fissure sealant application
  - Evaluation of data which records the condition of the fissure-filled teeth after 6 months (intact/partial loss/complete loss)

CYCLE 1 RESULTS



MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard	Verification	Cycle 1
1.	Examination and diagnosis	Operator trained in Modified MOH International Caries Detection And Assessment System (ICDAS) Charting (MMI)	100%	40% ⇨	100%
2.	Determination of tooth to be sealed with fissure sealant	Fully erupted tooth	100%	100%	100%
		Tooth should be free of caries	100%	100%	100%
		Tooth with complex, deep fissure	100%	49% ⇨	100%

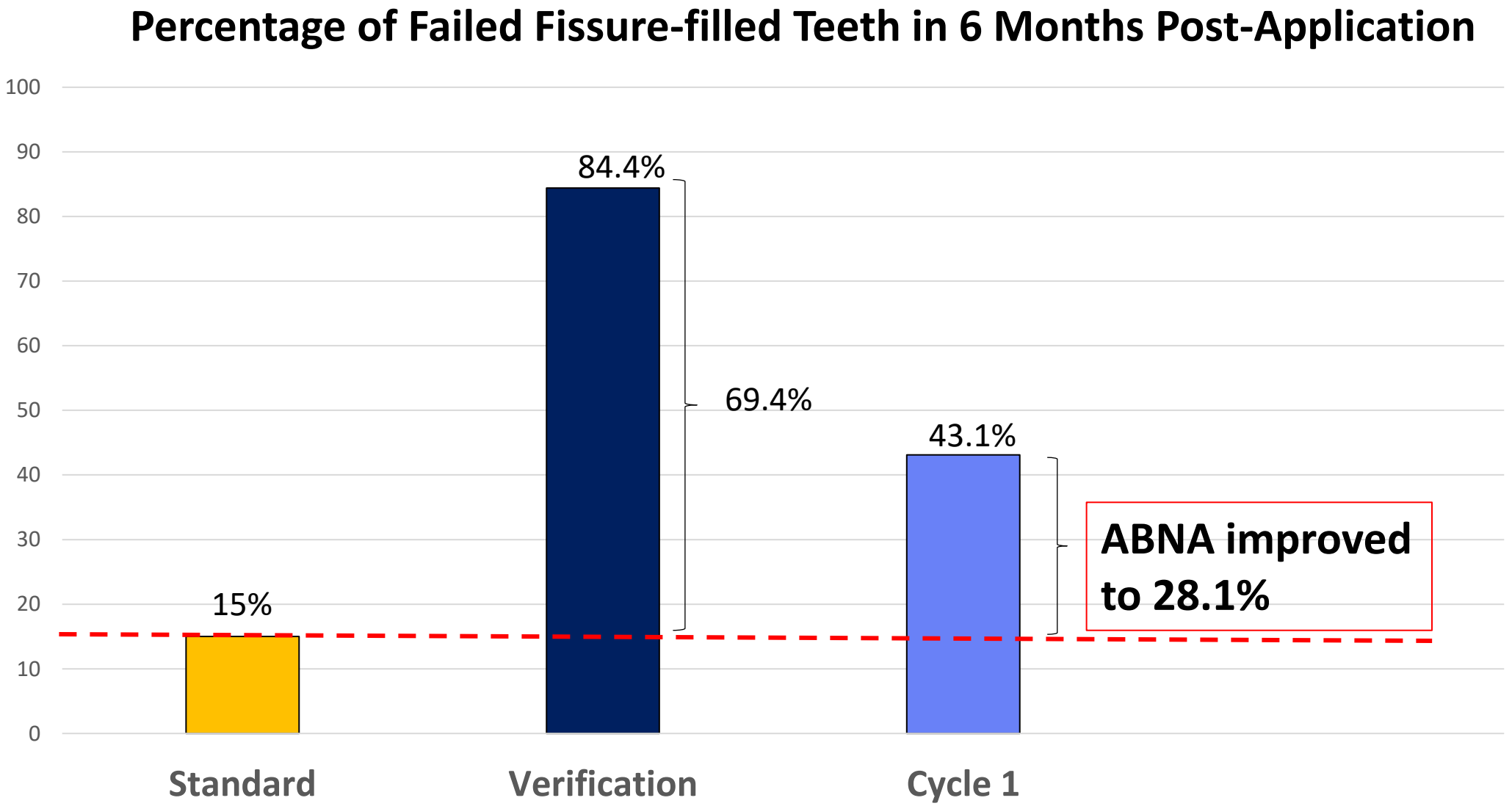
MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard	Verification	Cycle 1
3.	Availability of material and instrument needed for fissure sealant procedure	Fissure Sealant Checklist in patient's card record (LP.8) to guide operator before, during and after procedure	100%	0% ⇨	100%
4.	Tooth isolation	Isolation with cotton roll with saliva ejector (portable suction)	100%	31% ⇨	68.6%
		Availability of assistant to help with moisture control and material handling	100%	31% ⇨	88.2%
5.	Application of dentin conditioner / etching / light cure	Follow product manual	100%	38% ⇨	100%
		One tooth preparation at a time	100%	46% ⇨	100%

MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard	Verification	Cycle 1
6.	Contact between tooth after fissure sealant application	Ensure no bite interference with articulating paper	100%	100%	100%
7	Post-procedure instruction	Written post-procedure instruction given to patient for more clear instruction	100%	0%	100%
8.	Review post-procedure	Tooth sealed with fissure sealant reviewed in 6 months post-application	100%	100%	100%

ACHIEVABLE BENEFIT NOT ACHIEVED (ABNA)



WHY WE STILL FAILED?

1

- Portable suction machines were not available for several dental team.
- Good isolation could not be achieved. (**31.4%**, n= 16)

2

INSUFFICIENT MOISTURE CONTROL

CRITICAL STEP

- Four-handed dentistry still could not be practiced due to limited staff. (**11.8%**, n= 6)

ADDITIONAL STRATEGIES FOR CHANGE (INTERVENTION)

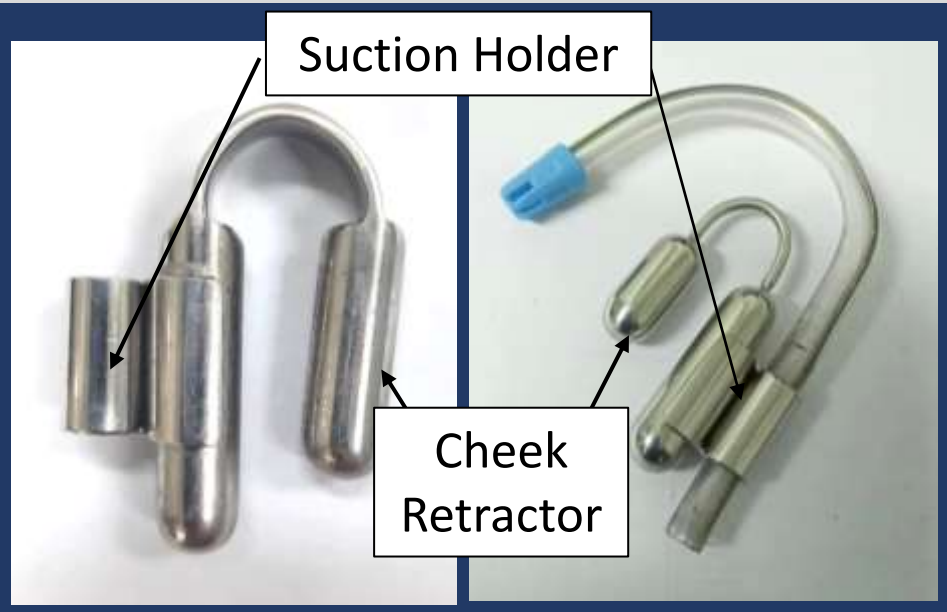
CYCLE 2

STRATEGIES FOR CHANGE CYCLE 2

Problem	Action
Limited availability of portable suction machine	Redistribution of portable suction machine to the ratio of 1 portable suction machine to 2 operators (dental therapist).
Unable to practice four-handed dentistry due to limited number of staff	Invention of Suction Anchorage Utility Holder (SAUH) to improve moisture control without the need of assistant.

ADDITIONAL STRATEGIES

S.A.U.H PROJECT



Suction Anchorage Utility Holder (S.A.U.H)

Innovation initiative done for school dental team specifically to hold saliva suction.

Aim to increase the efficiency of moisture control without the need of the assistant.

Cost per unit : RM 35.00

ADDITIONAL STRATEGIES

S.A.U.H PROJECT

Maximizes moisture control activity even with the unavailability of assistant during procedure.

ADDITIONAL STRATEGIES

S.A.U.H PROJECT

BEFORE

AFTER

Stainless Steel S.A.U.H

1. Easy handling by operators.

2. Reasonable cost with prestige look.

3. Lightweight ; ensure patient’s comfort.

4. Easily disinfect ; autoclave or soaked in disinfectant.

5. Universal use ; in any dental procedure that require saliva suctions.
   - -Filling
   - -Scaling

ADDITIONAL STRATEGIES

S.A.U.H PROJECT

BAHAGIAN KESIHATAN PERGIGIAN
NEGERI PERLIS
(MEMO PERHUBUNGAN)

Fail : JKNPS.830-04/1/2 (16) Tarikh : 14 Februari 2020

TAJUK	ARAHAN PENYERAGAMAN PRODUK INOVASI SAUH DI FASILITI PERGIGIAN NEGERI PERLIS
DARIPADA	[illegible]
KEPADA	Pegawai Pergigian Daerah Kangar Pegawai Pergigian Daerah Arau
SALINAN KEPADA	KPPK Perawatan Kesihatan Pergigian

Dengan segala hormatnya saya merujuk perkara di atas.

2. Adalah dimaklumkan bahawa penyeragaman dan penggunaan produk inovasi di bawah Bahagian Kesihatan Pergigian Negeri Perlis (BKPP) iaitu Produk Suction Anchorage Unity Holder (SAUH) adalah berkuatkuasa bermula tarikh surat ini dikeluarkan.

3. Produk SAUH berfungsi sebagai penetap posisi penyedut air liur [illegible] [illegible]

Tarikh : 16 Februari 2020 & 23 Februari 2020

Masa : 2.30 petang – 4.00 petang

Tempat : Bilik Gerakan, Aras 1, Kompleks JKN Perlis

4. Mohon kerjasama pihak tuan bagi mencalonkan dan memberi pelepasan kepada sekurang-kurangnya 5 anggota pergigian dari setiap fasiliti bagi tujuan tersebut. Untuk makluman, pembahagian unit SAUH akan dibuat mengikut ketetapan seperti di Lampiran 1. [illegible] dengan ucapan terima kasih.

Sekian, terima kasih.

(DR HJH FAREHAH BINTI HJ OTHMAN)
No. Pendaftaran MPM : 1885
☎ : 3309
Faks : 04 975 1489
Emel : [illegible]@moh.gov.my

LAMPIRAN 1

PEMBAHAGIAN UNIT SAUH KEPADA FASILITI DI BAWAH BAHAGIAN KESIHATAN PERGIGIAN NEGERI PERLIS

BIL	KLINIK	BILANGAN PASUKAN PERGIGIAN BERGERAK	BILANGAN UNIT SAUH
1	KLINIK PERGIGIAN KANGAR	13	20
2	KLINIK PERGIGIAN BESERI	9	20
3	KLINIK PERGIGIAN PADANG BESAR	2	15
4	KLINIK PERGIGIAN UTC	0	5
5	KLINIK PERGIGIAN KAKI BUKIT	2	15
6	KLINIK PERGIGIAN ARAU	9	20
7	KLINIK PERGIGIAN KUALA PERLIS	4	20
8	KLINIK PERGIGIAN KG.GIAL	2	15
9	KLINIK PERGIGIAN SIMPANG EMPAT	4	15
10	KLINIK PERGIGIAN KUALA SANGLANG	2	15

Standardization of the use of SAUH and distribution to all primary dental facilities in Perlis.

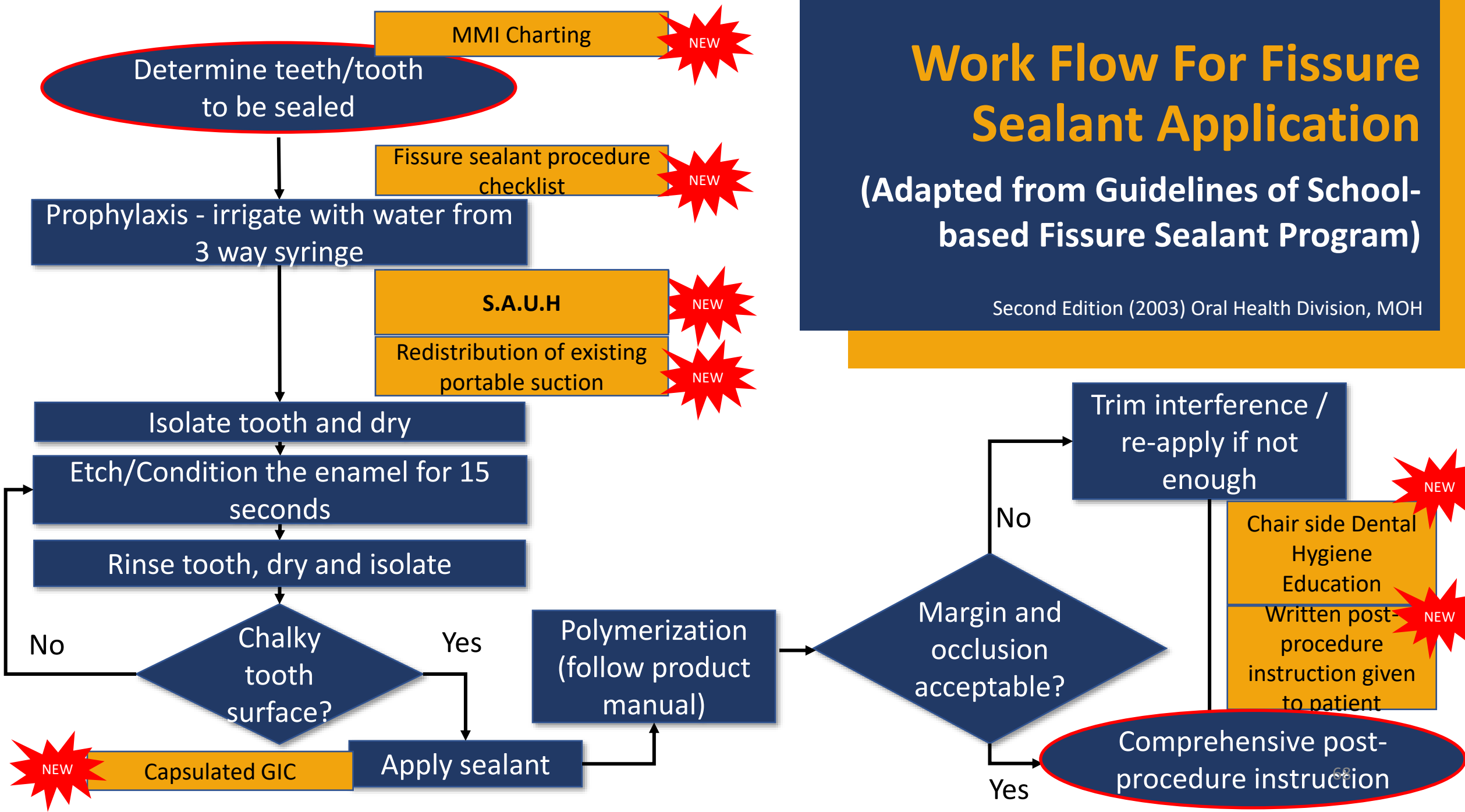
ADDITIONAL STRATEGIES

Redistribution of existing portable suction with at least 1 unit to 2 operators (1 school dental team).

Work Flow For Fissure Sealant Application

(Adapted from Guidelines of School-based Fissure Sealant Program)

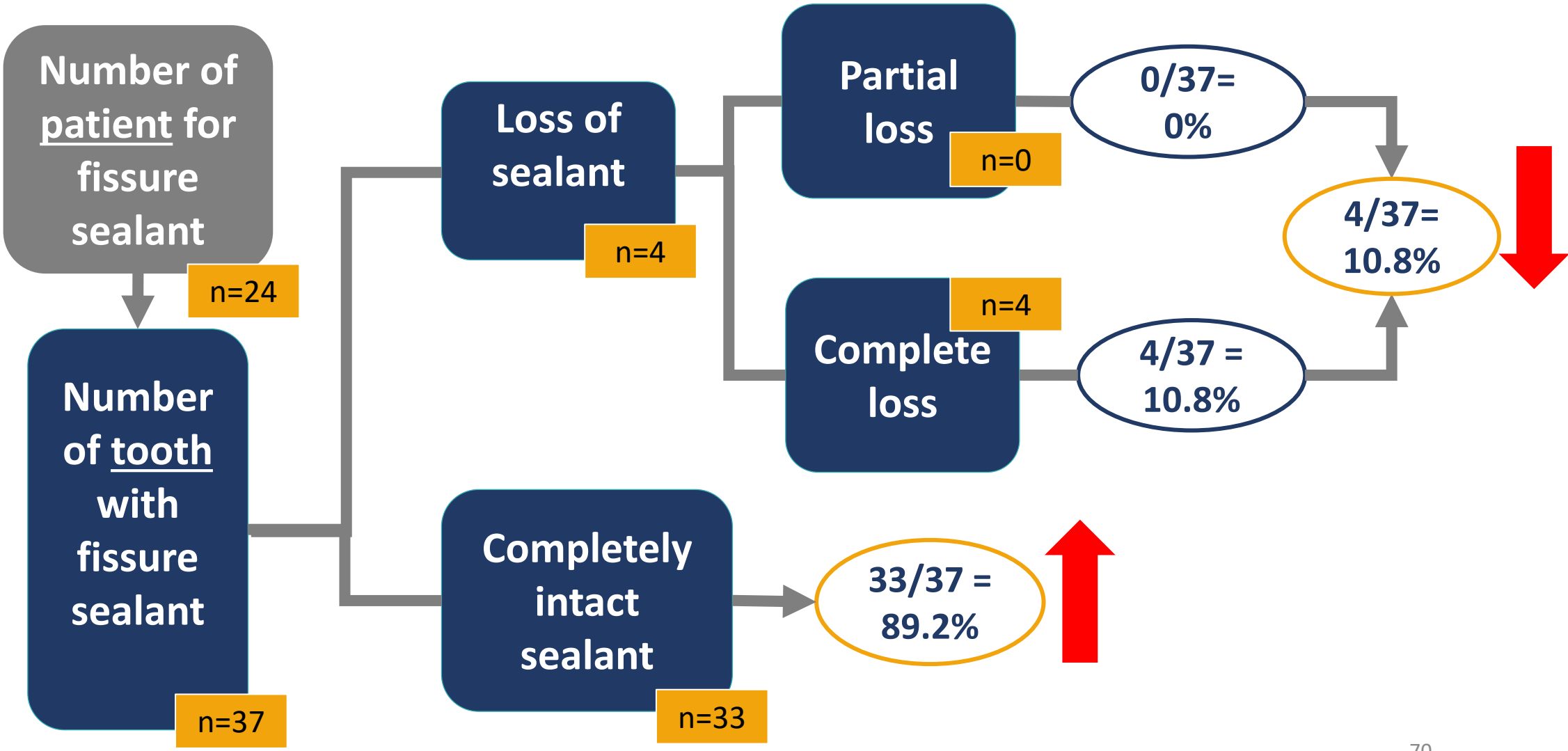
Second Edition (2003) Oral Health Division, MOH



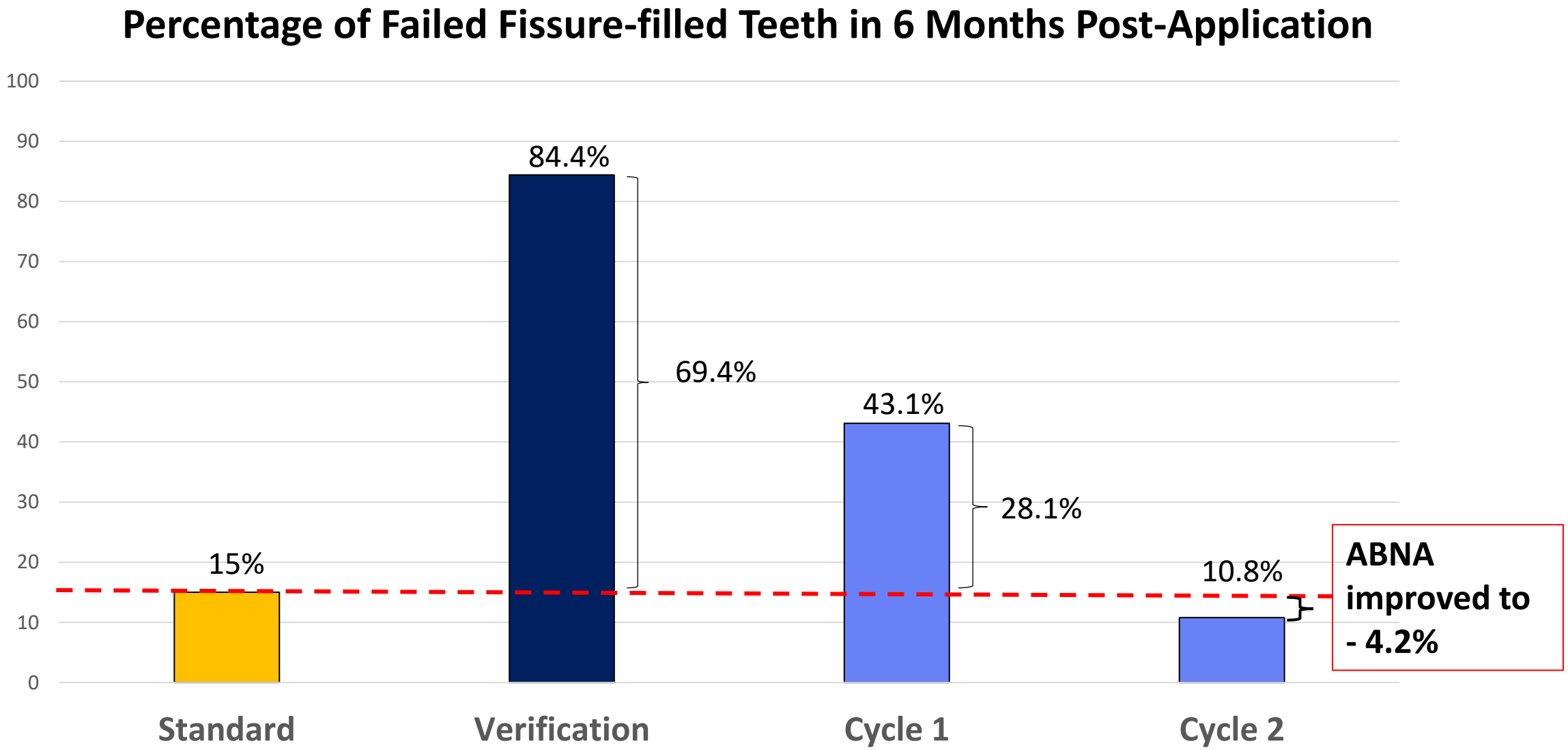
EFFECT OF CHANGE CYCLE 2

- **Aim**
  - To further reduce the percentage of failure of fissure- filled teeth among primary schoolchildren in Perlis.
- **Place**
  - 13 primary schools in Perlis
- **Duration**
  - 3 months (January 2020 until March 2020)
- **Samples**
  - 24 patients involving 37 teeth
- **Study instruments**
  - Oral examination and patient's record (LP.8 cards)

CYCLE 2 RESULTS



ACHIEVABLE BENEFIT NOT ACHIEVED (ABNA)



MODEL OF GOOD CARE

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		Tooth should be free of caries	100%	100%	100%	100%
		Tooth with complex, deep fissure	100%	49%	100%	100%

MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard	Verification	Cycle 1	Cycle 2
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		One tooth preparation at a time	100%	46%	100%	100%

MODEL OF GOOD CARE

Step	Process of care	Criteria	Standard	Verification	Cycle 1	Cycle 2
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8.	Review post-procedure	Tooth sealed with fissure sealant reviewed in 6 months post-application	100%	100%	100%	100%

LESSON LEARNT

STRENGTH

1. First study to be conducted in *Bahagian Kesihatan Pergigian Perlis* to assess the overall picture of fissure sealant retention done as preventive measure in school dental treatment.

2. Remedial actions taken were proved efficacious to be practiced among operator and assistant especially in school setting.

3. Innovation of new product (SAUH) to cater the limited resources/staff.

LESSON LEARNT

LIMITATION

1. COVID-19 pandemic that struck in early 2020 resulted in restriction of school dental team access to school, thus made it impossible for check up, treatment and review to be done.

2. Permission for school dental treatment were resumed in April 2022, therefore another cycle of review were expected to be done by the end of 2022.

NEXT STEP

STEP 1

Continuation of intervention planned throughout all primary clinics in Perlis.

STEP 2

Set new gold standard of 5% and **plan for adoption as national standard** to monitor fissure-filled teeth failure.

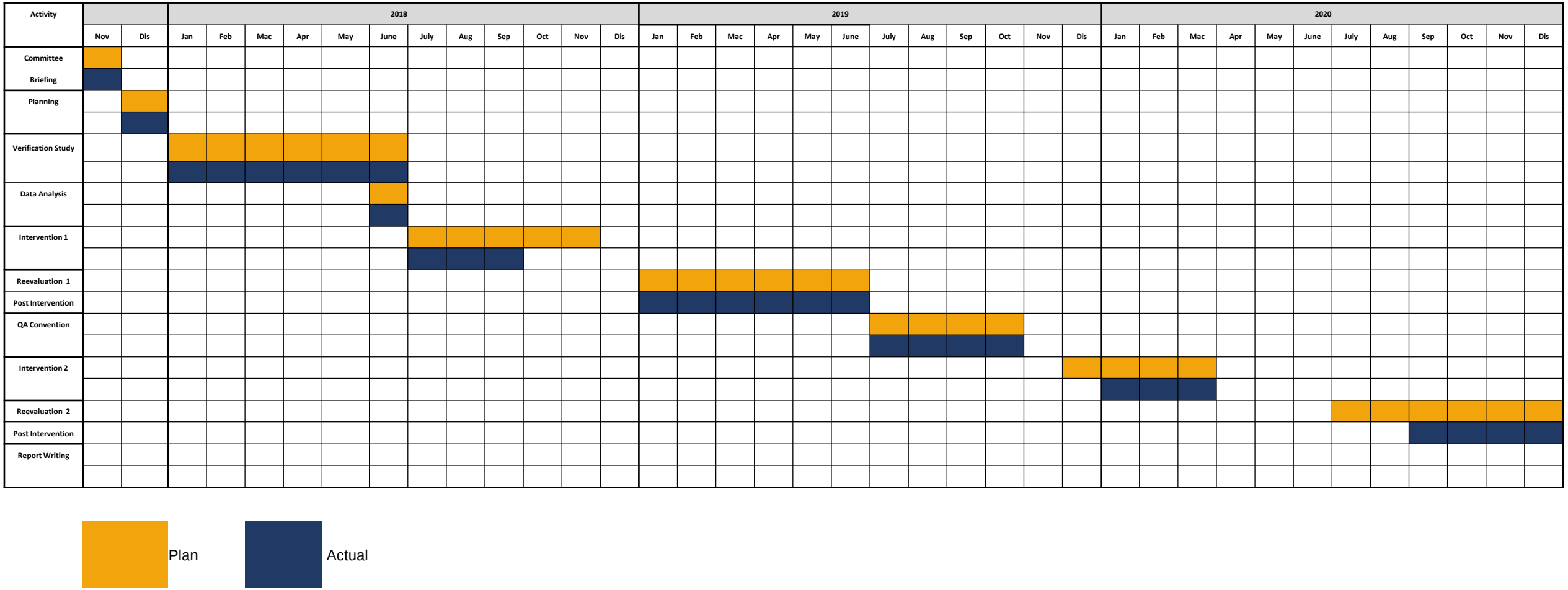
STEP 3

The **developed procedural guideline and interventions** will be subsequently shared with another state.

CONCLUSION

NO	OBJECTIVE	CONCLUSION
1.	To measure the percentage of failure of fissure-filled teeth in 6 months post-application among primary school children in Perlis.	Verification study found that **84.4% of fissure-filled teeth were failed in 6 months post-application.**
2.	To determine the possible causes that contributes to the failure of fissure-filled teeth.	The main contributing factor was **insufficient moisture control.** Other factors attributed were improper technique, incorrect tooth selection and poor post-procedure care.
3.	To identify and formulate measures to reduce percentage of failure of fissure- filled teeth.	Strategies formulated include introduction of **Fissure Sealant Checklist, circulation of improvised SOP among operator, the use of MM-ICDAS dental charting and capsulated GI sealant, live chair-side guidance and hands on, calibration and privileging of operator, comprehensive post-procedure care and invention of SAUH product** to assist in moisture control.
4.	To evaluate the effectiveness and the sustainability of the remedial measures.	Post-remedial, the **percentage of failure** of fissure-filled teeth **dropped from 84.4% to 10.8%.**

GANTT CHART


Activity
2018
2019
2020
Nov
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June
July
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Sep
Oct
Nov
Dis
Committee
Briefing
Planning
Verification Study
Data Analysis
Intervention 1
Reevaluation 1
Post Intervention
QA Convention
Intervention 2
Reevaluation 2
Post Intervention
Report Writing
Plan
Actual

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- Perlis Deputy State Health Director (Oral Health); Dr. Khairol Niza binti Ahmad
- Advisor & Trainer ; Dr. Mohamad Ezzat bin Mohamad Ismail
- Facilitators ; Dr. Isma Liza binti Ali & Dr. Syirahaniza binti Mohd Salleh
- All dental therapist and staff of Perlis Oral Health Division