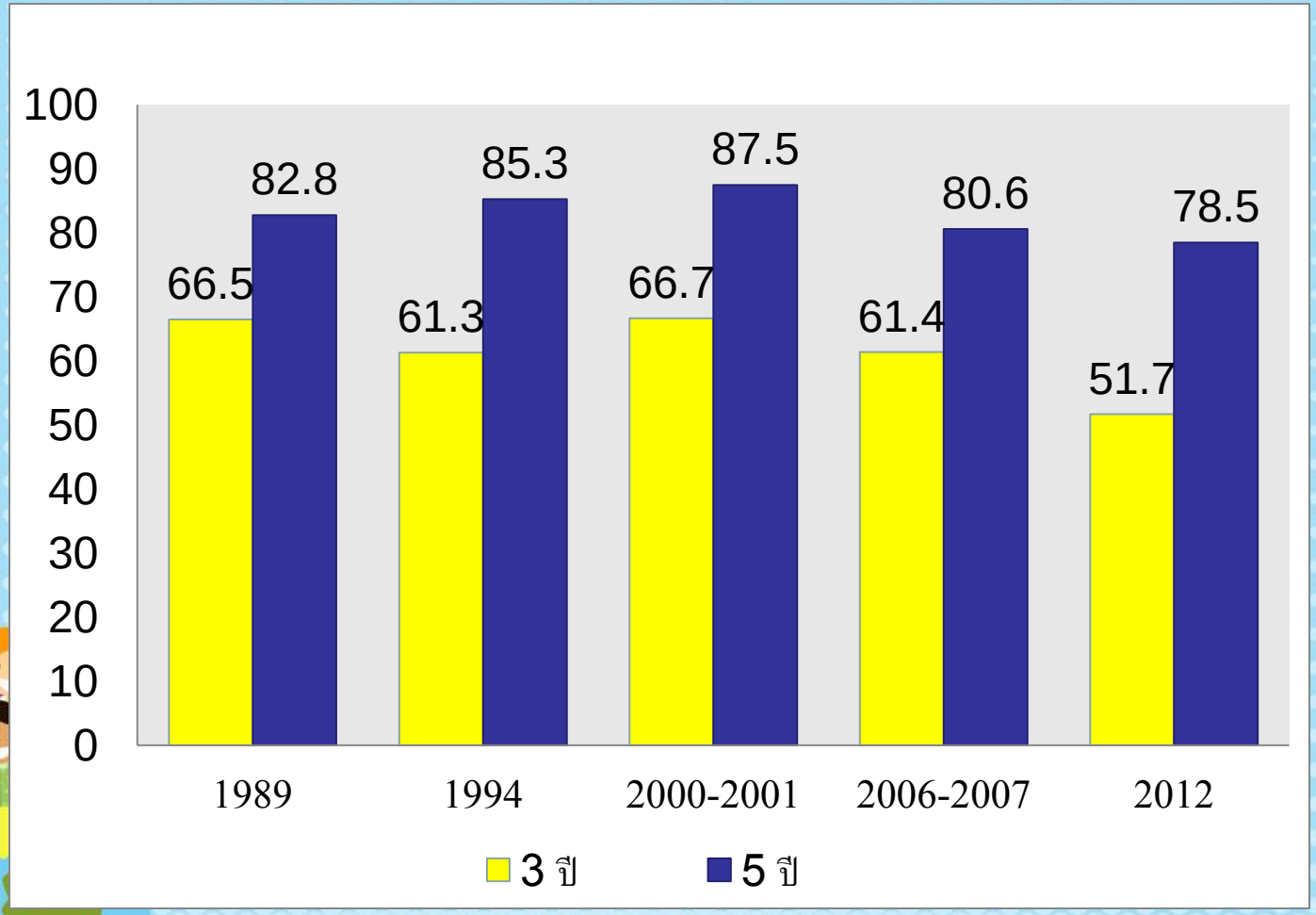
แนวคิดการจัดการโรคฟันผุในเด็กเล็ก

นำแสดงโดย

ทพญ.อุมาพร วิระพรสวรรค์

การสำรวจสภาวะทันตสุขภาพในประเทศ ปี 2555



Data source: Bureau of Dental Health, Thailand

Prevalence of primary teeth caries

- Prevalence of ECC rose sharply from 2.0% at 9 months to 68.1% at 18 months. (*Thitasomakul et al., 2006)*
- In 15-19month-old children, the prevalence of ECC was 82.8% (42.0% noncavitated + 40.8% cavitated lesions) (*Vachirarojpisan et al. 2003)*

Untreated caries:

Thailand National Oral Health Survey (2012)

- **at 3 years old**, dmft was 2.7 and **only 2.9% filled**
- **at 5 years old**, dmft was 4.4 and **only 9.3% filled**

- class I and II restorations were needed in most children

Untreated caries in children: Why?

- Less important due to expected exfoliation of primary teeth
- Severity of carious lesions due to non-early detection and care
- Dental fear in children due to sound and water from aeroter drilling machine & injection
- Child management problem in general dentists

Eruption times and lifespan of deciduous teeth (in years)*

	Deciduous eruption times	Permanent eruption times	Lifespan
Central incisor	0.5	7	6.5
Lateral incisor	0.75	8	7.25
Canine	1.5	9/12[a]	7.5/10.5[a]
First molar/premolar	1	10	9
Second molar/premolar	2	11	9

**Kidd, van Amerongen, van Amerongen; 2008*

ฟันผุเกิดขึ้นได้อย่างไร

Dynamic Process of Dental Caries Plaque/Enamel Interface (Zero 2011)

demineralization

$8H^+ + Ca_{10}(PO_4)_6OH_2$

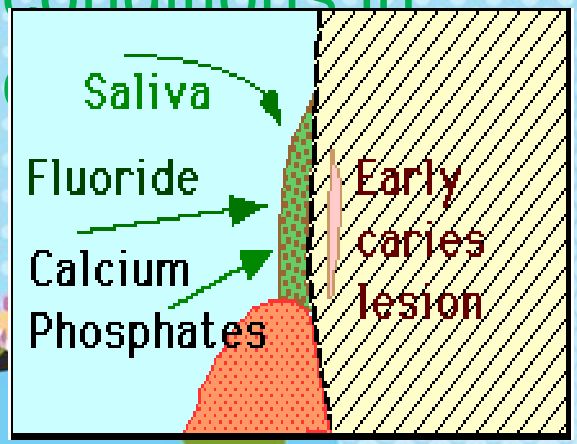
F

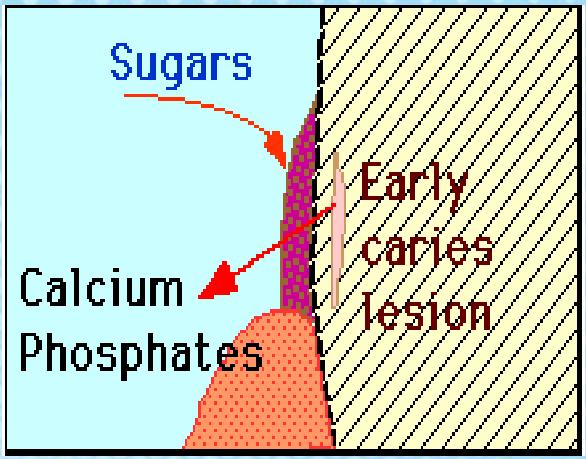
remineralization

Undersaturated conditions in oral fluids

$6(HPO_4)^{--} + 10Ca^{++} + 2H_2O$

Supersaturated conditions in





Fluoride

การแปรงฟัน – ยาสีฟัน + แปรงสีฟัน

ไหมขัดฟัน

น้ำยาบ้วนปาก

ฟลูออไรด์วานิช

Preventive program

ANC

Oral exam,
OHI, Tx.

WCC

Oral exam, OHI,
monitor

0-5 year : F varnish

Preschool

Oral exam, OHI,
Brushing, fruit 3d/wk.

School

Oral exam, OHI,
Brushing, no soft drink

สำนักทันตสาธารณสุข กรมอนามัย กระทรวงสาธารณสุข, 2556

Practical Caries management for primary teeth

- Fluoride toothpaste, non-operative therapy, for **non-cavitated, initial, enamel caries**
- Fluoride varnish for **cavitated enamel caries**
- Sealants with Glass Ionomer Cement for **non-cavitated dentine caries**
- Conservative, (partial), caries removal and GIC ***"SMART"*** restorations for **frank open cavitated dentine caries**

GI in primary teeth restorations

- A 1-yr evaluation of the success rate of *Cl I & II restorations of the primary molars restored with* ***high-viscosity GI*** *was 94%* (Yilmaz Y et al 2006)

- After 1 yr, the overall *survival restorations of GI was 95% for Cl I and 82% for Cl II restorations* – ***Simplifed, Modified ART or "SMART"***

  (Phonghanyudh A et al 2012)

Approaches to treating carious primary teeth

- Specialists in pediatric dentistry
  - limited number
- General dental practitioners
  - busy schedule work plan, child management
- Dental therapists or dental nurses
  - preventive restoration approach
  - less invasive dental treatment
  - changing attitudes and priorities

การบูรณะฟันผุคุณภาพ SMART

- SMART คืออะไร
- SMARTทำอย่างไร
- SMART ใช้วัสดุอะไร
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- SMART ทำเมื่อไร
- SMART มีขั้นตอนอย่างไรบ้าง
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SMART as a minimum intervention approach

Minimum instrument	only hand instrument
Minimum procedure	Partial caries removal & filled with Glass ionomer
Minimum pain	no anesthetic injection
Minimum trauma	save tooth structure
Minimum stress & fear	patients' friendly
Maximum quality	prevention & restoration

ART → SMART: Development

ART	SMART
1987	2012 (25 years later)
use only hand instruments to remove caries	use hand instruments but only partial caries removal
filled with self-cure powder-liquid hand-mixed glass ionomer	filled with self-cure capsulated glass ionomer
aimed at permanent molar	aimed at primary dentition
target at primary school children	target at pre-school children

SMART preventive restoration:

- **S**ave natural tooth structure and composition
- environmental friendly **M**aterials
- **A**trauma and patients' friendly
- accessible dental **R**estoration
- Randomized Clinical **T**rial in **T**hailand

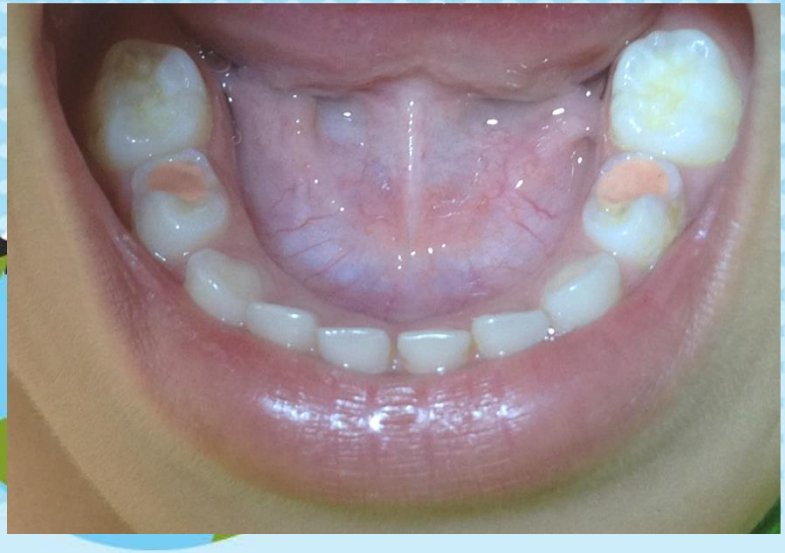
- SMART phone, SMART car, SMART TV, etc.
- SMART dental restoration – Simplified Modified Atraumatic Restorative Technique
  - *Phantumvanit P 2012 IJOH*

SMART ทำอย่างไร

ก่อน remove caries

หลังจาก remove soft caries

SMART



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Riva SC
(GIC)

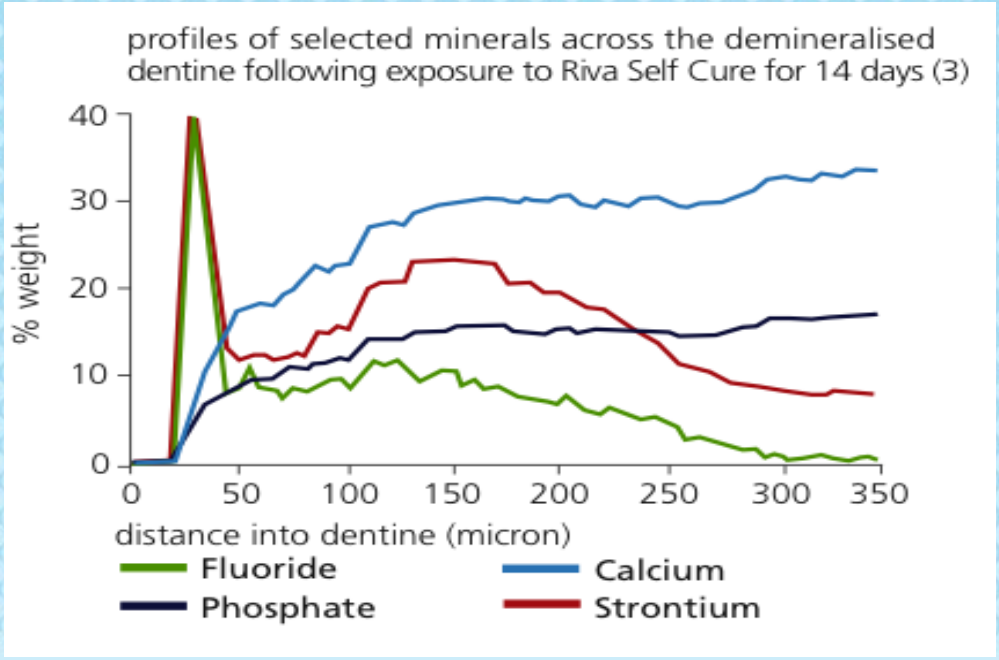
Proven ionic exchange

Study by:

McIntyre JM et al, Ion exchange between Riva

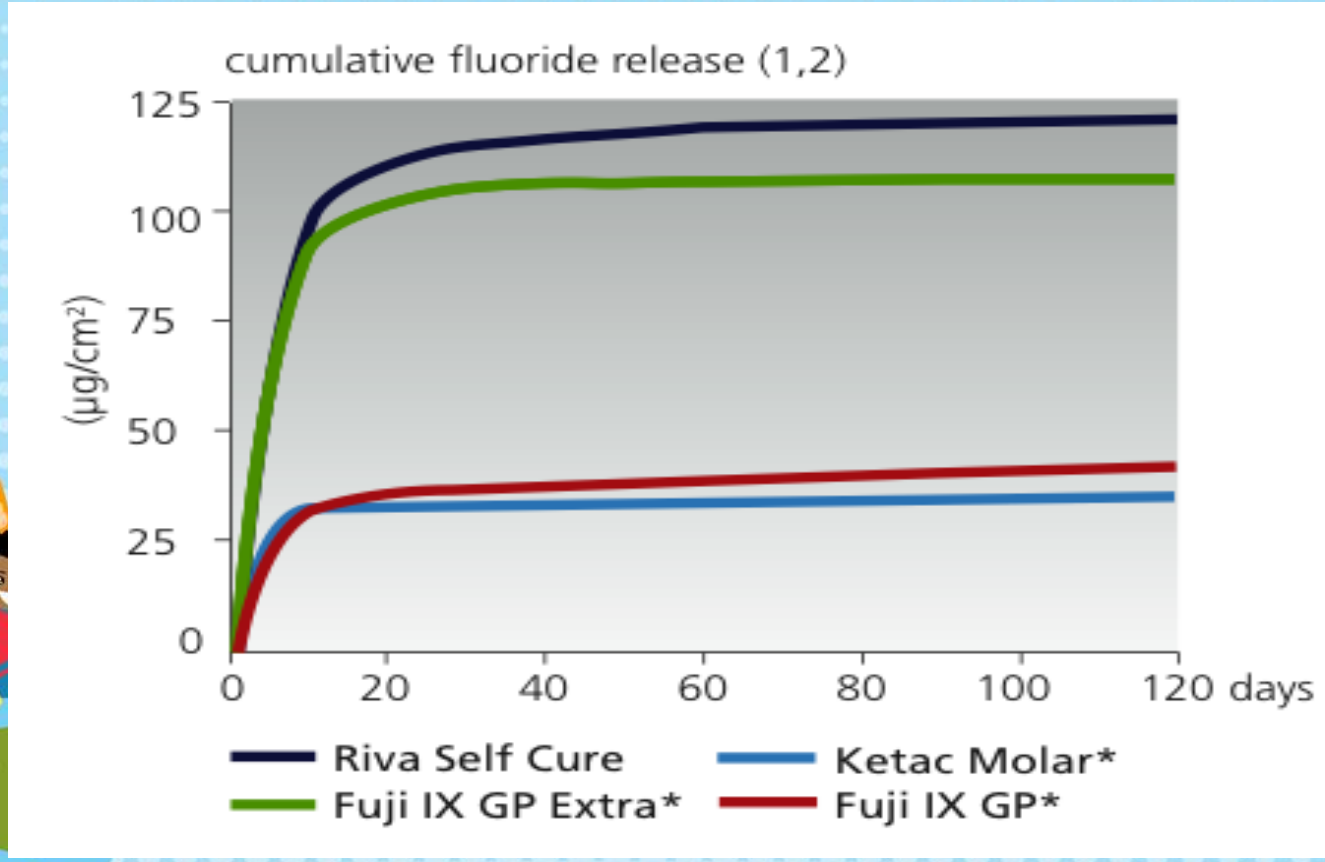
Self Cure GIC and demineralized dentine, Uni

Adelaide, Brisbane IADR 2006



SMART - Korat

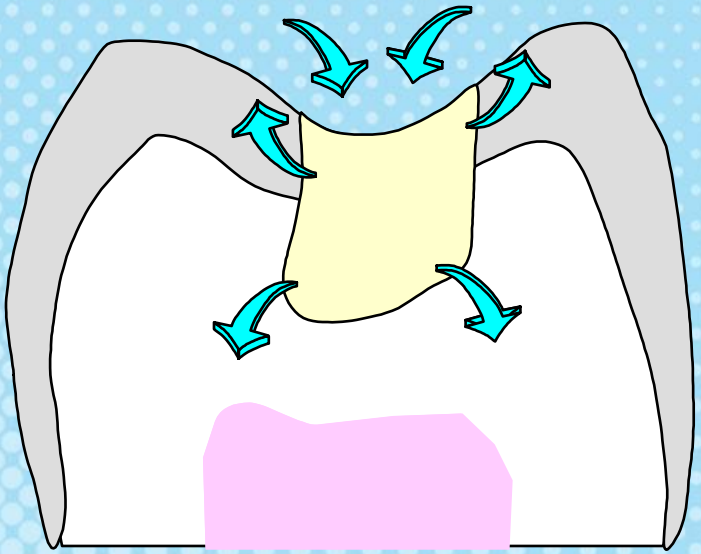
Fluoride release



Fluoride released from Glass Ionomer

Fluoride

- Internal to cavity wall
  - Bacteriostatic
  - Remineralization
- External to the oral environment
  - Released into tooth tissues and saliva
  - GI restorations and sealants take up fluoride (recharge)



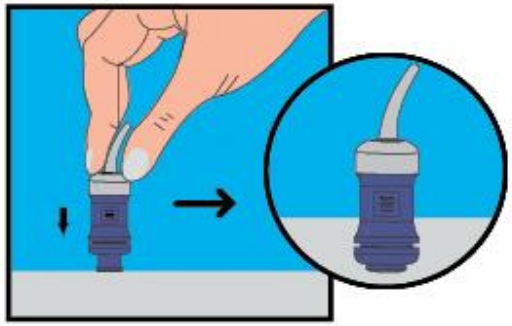
Glass Ionomer Cement

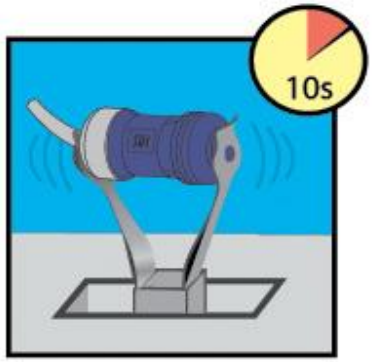
Fits into the contemporary concept of Minimal intervention: allow remineralization of carious tissue and repair of damage tooth structure with biomimetic/therapeutic material.

- Adhere to teeth: chemical bonding to teeth
- Fluoride release, rechargeable-remineralized tissue adjacent to material
- Coefficient of thermal expansion closed to tooth structure- good marginal adaptation
- Anti-microbial effect:
- Its fluoride release or others released agents, the low pH of the cement before setting
- Not sensitive to moisture
- Easy to repair
- Biocompatibity to pulp

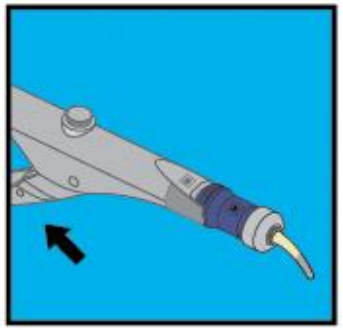
Capsulated glass ionomer

4 Activate the capsule and immediately mix in an amalgamator.





5 **Immediately** place into capsule applicator and click trigger until paste is seen through the nozzle.



6 Extrude Riva Self Cure into cavity and contour.

Setting time for capsulated GIC

Mixing time: **10 sec**

Working time: **1 min 40 sec**

Initial setting time: **4 min 10 sec**

Final finishing time: **6 min**

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When shall SMART be applied?

- Early frank cavitated dentine caries
- As young as 2-3 years old children
- In day-care, pre-school, kindergarten children, especially
- Also in primary school children

Case selection:

Inclusion

- Vital teeth
- Small or big cavities
- Single or multiple surfaces
- Shallow or deep lesions
- Healthy teeth

Exclusion

- Frank pulp exposed teeth
- Abscess
- Fistula
- History of pain or swelling
- Non-functional teeth

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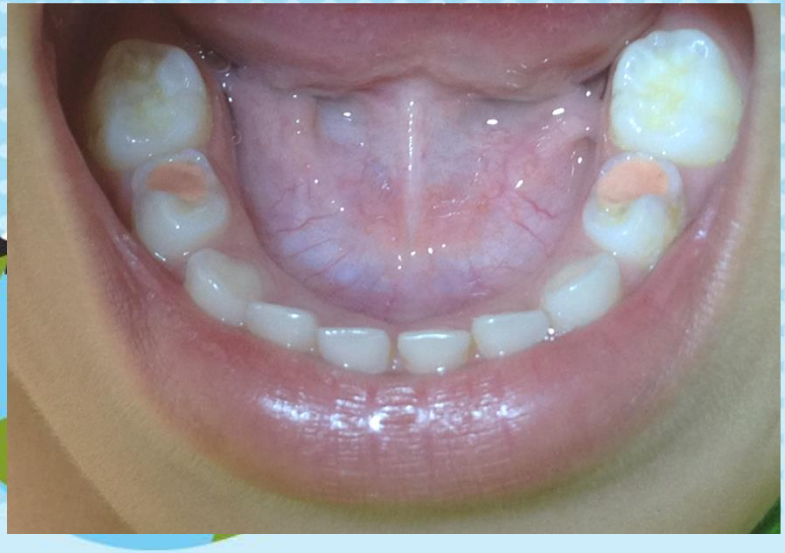
ก่อน remove caries

หลังจาก remove soft caries

SMART



SMART มีขั้นตอนอย่างไรบ้าง

- ตัก
- ทา
- อุด
- ปาด

ภาพเด็กที่ทำ caries control

ลักษณะรอยอุดหลังจาก 6 เดือน

ลักษณะรอยอุดหลังจาก 6 เดือน

SMART มีขั้นตอนอย่างไรบ้าง

- ตัก
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Preparation for Patient & Operator Support

A comfortable and stable position for lengthy periods of dental treatment

Patient: lie down on a flat surface to support the body

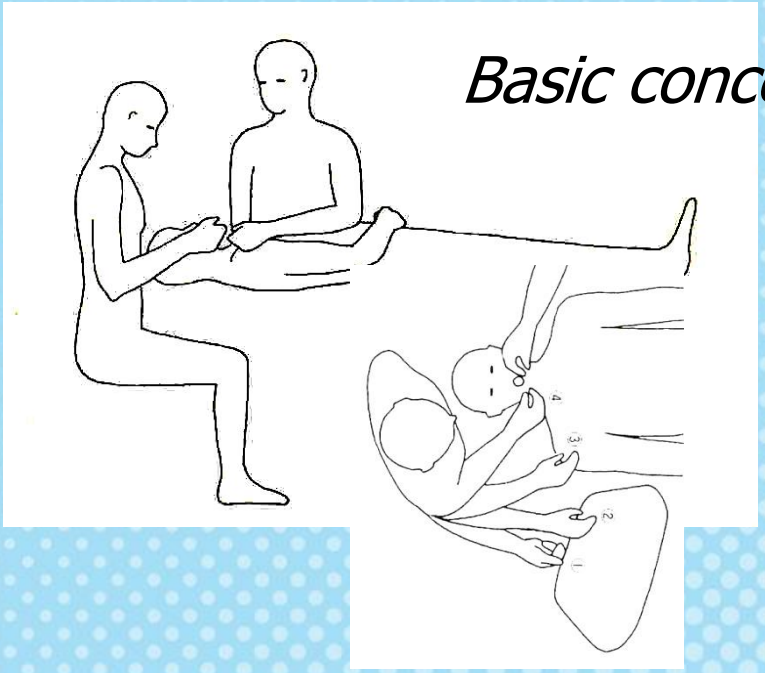
Operator: sit upright at 12 o'clock

Assistant: sit at the left side of the patient & operator

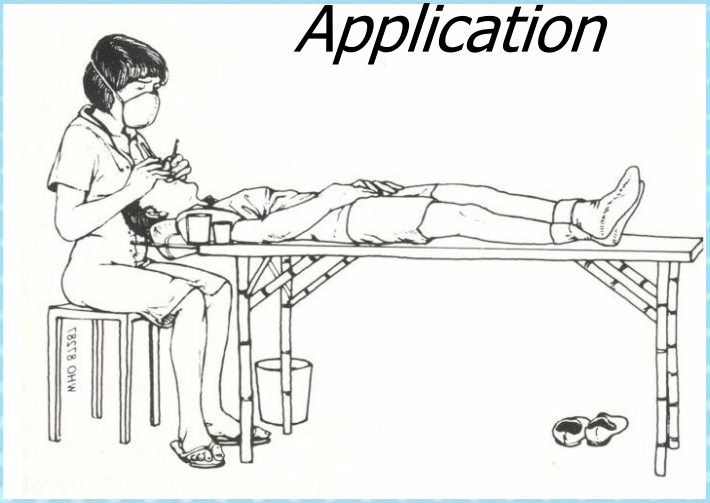
•Height relation between operator and patient = ~ 30 cm. from operator's eyes to the patient's mouth

Less stress Working environment

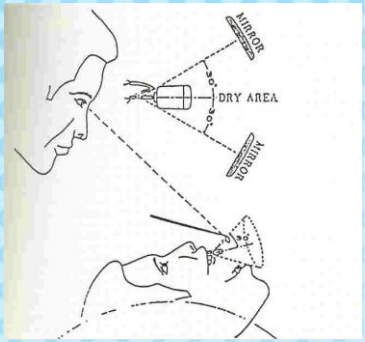
Basic concept



Application



- ✓ Height relation between operator➔patient =~30 cm from operator's eyes to the patient's mouth



Neck support

SMART มีขั้นตอนอย่างไรบ้าง

- ตัก
- ทา
- อุด
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SMART hand instruments

Excavator

Carver

Water drop

Dentine condi-tioner

SMART มีขั้นตอนอย่างไรบ้าง

- ตัก
- ทา
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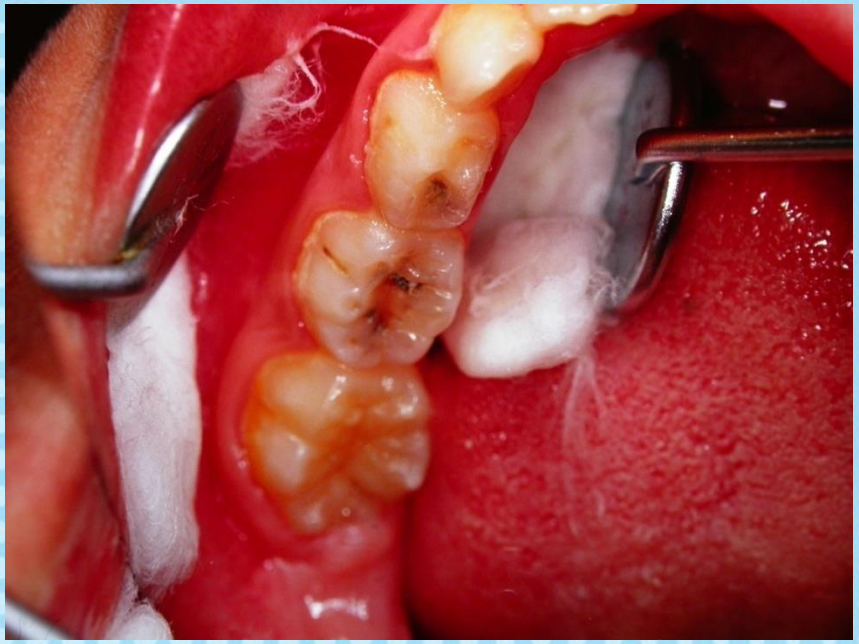
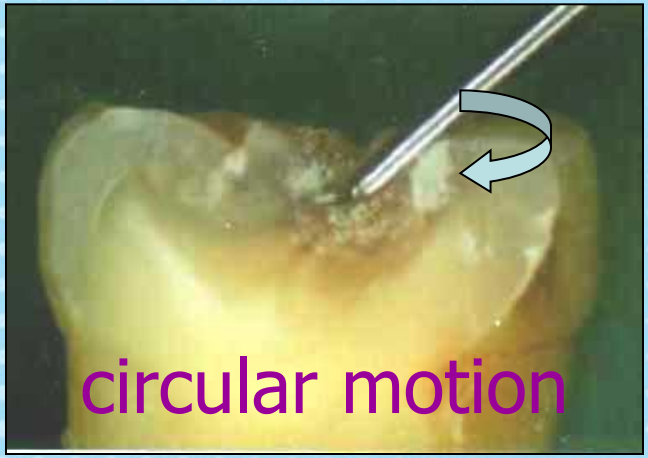
Moisture and saliva control using cotton rolls

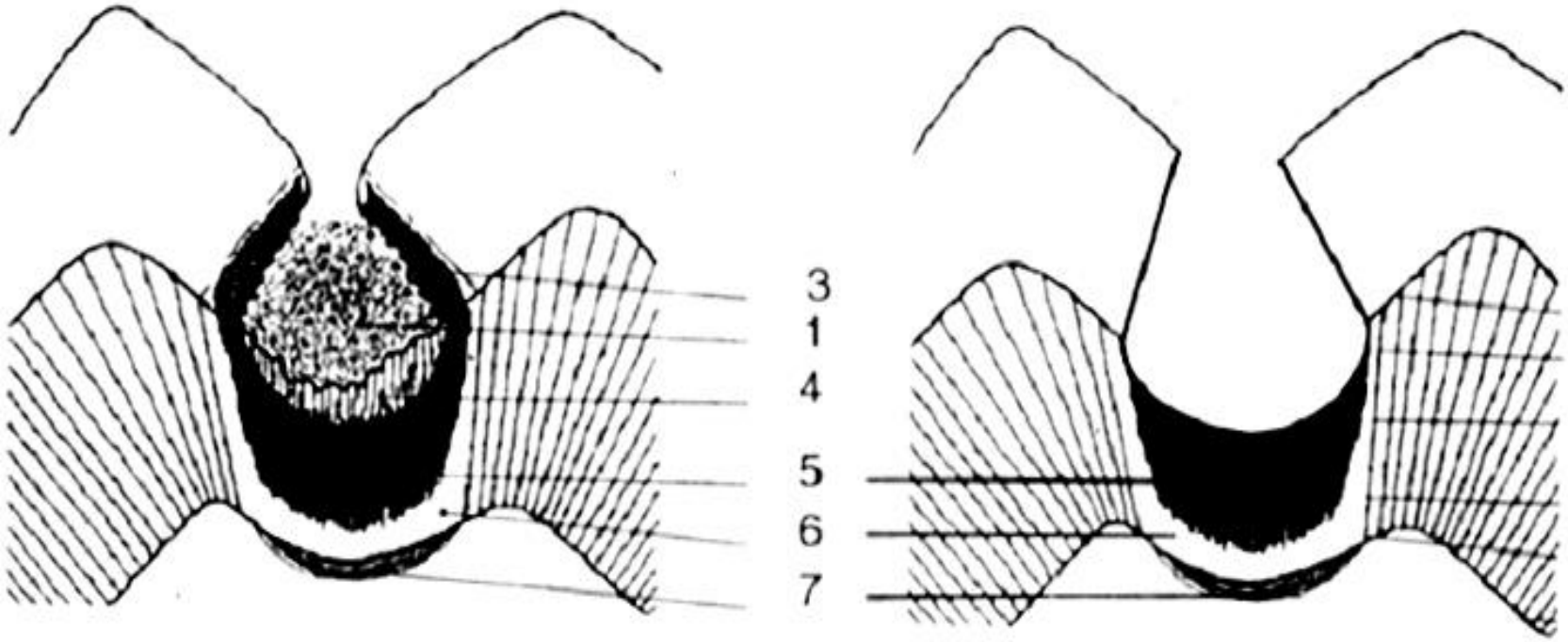


Action of carious dentine removal

- **Remove the zone of bacterial invasion and destruction of carious dentine <u>with spoon excavator</u>**
- Make **circular scooping movement from DEJ downwards**
- <u>Protect the pulp at the floor of deep cavities</u>



Biological approach to cavity cleaning



Dentinal lesion in an occlusal surface

Biological cavity preparation

1: Dental plaque; 3: Demineralized enamel; 4: Zone of bacterial invasion and complete demineralization; 5: Zone of partial demineralization; 6: Transparent zone; 7: Reactive dentine


SMART - Korat

SMART มีขั้นตอนอย่างไรบ้าง

- ตัก
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Remove smear layer to clean the cavity

Dentine with smear layer

- Final clean the cavity by removing the smear layer by 10 sec application of 10% polyacrylic acid (dentine conditioner)
- Then wash and dry the cavity

(Mount & Hume, 1998)

Dentine conditioner

- To increase the surface retention or adhesion of the GI with the dentine,
- The cavity must be clean completely and free of smear layer which occurs during the caries removal.
- Use the Dentine Conditioner to clean the smear layer.

Dappen disk/ tumbler/ small cup

- Use to carry water for cleaning the cavity before filling

Riva SC
(GIC)

Riva SC
(GIC)

1 Isolate tooth, prepare cavity. Apply Riva Conditioner (26% polyacrylic acid for 10 seconds or Super Etch 37% Phosphoric Acid for 5 seconds.

Riva SC
(GIC)

2 Wash thoroughly.

3 Remove excess water.
Keep moist.

SMART มีขั้นตอนอย่างไรบ้าง

- ตัก
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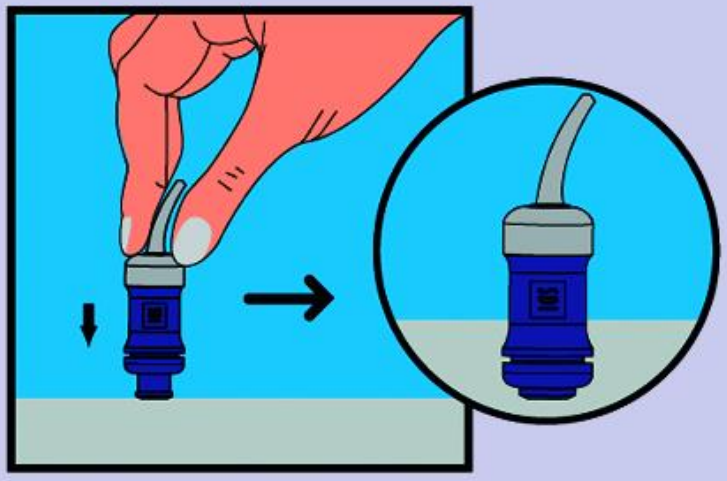
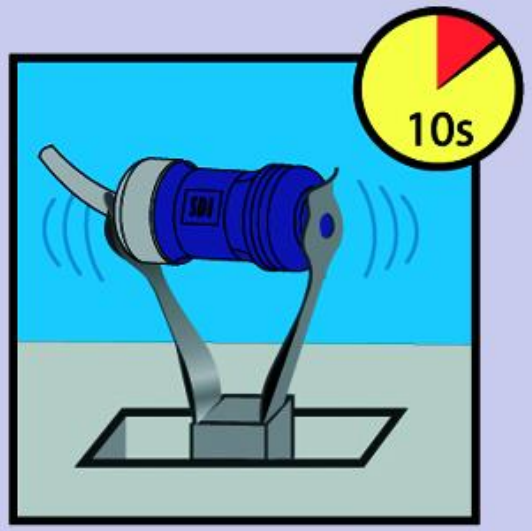
Riva SC
(GIC)

4 Activate the capsule and immediately mix in an amalgamator.
Important: Do not click with applicator before you mix.





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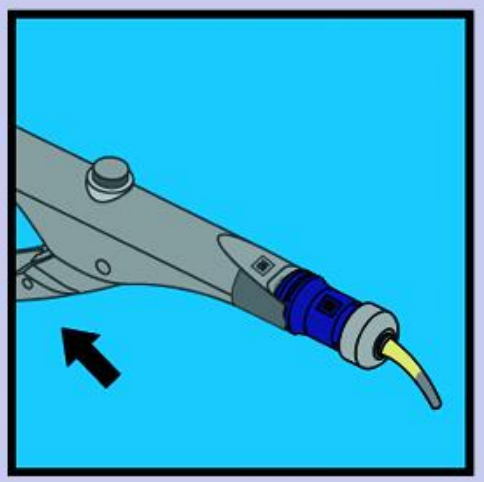

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COMPREHENSIVE CARIES PREVENTIVE PROGRAM IN CHILD DEVELOPMENT CENTER

LABLAE DISTRICT , UTTARADIT

SASIPIMON CHANRAT
AMORNWAN CHOUYRAUNG
Master of Science Program in Pediatric Dentistry
Faculty of Dentistry , Mahidol University

THE OBJECTIVES OF THE STUDY

1. **to compare increment of caries experiences between study group and control group at12 months**
2. **to compare oral hygiene status between study group and control group at12 months**
3. **to compare child's behavior in dental visit at child development centers between study group and control group at 12 months**

Control group

National oral health program

1. Oral health education
2. Tooth brushing with fluoridated toothpaste
3. Fluoride varnish application every 6 months
4. The children who need dental treatment will be refer to treatment by dentist in dental clinic/ hospital

Study group

Comprehensive caries preventive program

1. Oral health education
2. Tooth brushing with fluoridated toothpaste
3. Fluoride varnish application every 6 months
4. Deep pit and groove sealing with Fuji VII
5. filling : Partial caries removal with Fuji IX GP EXTRA.
6. The children who need dental treatment will be refer to treatment by dentist in dental clinic/ hospital

Evaluation Data

Data	Control n=90	SMART n=89	P-value
dmft (baseline)	**3.6±4.8**	**3.6±4.0**	**0.95**
dmft (12months)	**6.8±5.7**	**4.4±4.5**	**0.003**
dmfs (baseline)	**12.4±19.5**	**8.5±12.9**	**0.11**
dmfs(12months)	**19.2±23.5**	**10.7±14.2**	**0.004**
Increment of dental caries after 12 months (2.4 dmft, 4.7 dmfs)			
dmft	**3.2±2.7**	**0.8±1.6**	**<0.001**
dmfs	**6.9±6.8**	**2.2±3.88**	**<0.001**

Cost Effective analysis

categories	Intervention Group (n=89)	Control group (n=90)
Mean dmft difference in increment	0.83±1.55	3.24±2.71
Increment dmft difference avoided/child	2.41	
Program cost (Baht) (1)	39,626.95	-
Dental health care cost (Baht) (2)	22,171	27,875
Cost of averted disease (Bath) (3)	148,094	344,037
Total cost(Baht) (1+2+3)	209,891.95	371,912
Total cost /child (Bath) (1+2+3)/n	2,358.64	4,132.36
Net more cost/child (Baht)	1,774.02	
Increment cost effective ratio	1,774.02/2.41= 736.11	

Cost of averted disease and Productivity Loss cost

Item	Intervention (n=89)	Control (n=90)
Filling (Baht)	69,320	112,090
Stainless steel crown (Baht)	26,400	72,000
Pulp treatment (Baht)	17,400	73,225
Extraction (Baht)	7,650	17,170
Dental treatment cost (Baht)	120,770	274,485
Productivity Cost (Baht)	18,975	48,300
Travelling Cost (Baht)	8,349	21,252
Total (Baht)	148,094	344,037

ประโยชน์จาก **SMART**

- คุณภาพชีวิตของเด็กดีขึ้น
- ฟันน้ำนมไม่ถูกถอนไปก่อนเวลา
- ประหยัดค่าใช้จ่ายของครอบครัว/รัฐ

SMART มีขั้นตอนอย่างไรบ้าง

- ตัก
- ทา
- อุด
- ปาด

SMART

- ทำง่าย
- เร็ว
- ไม่เจ็บ

To be continue..