



CALIFORNIA SOCIETY  
OF PEDIATRIC DENTISTRY



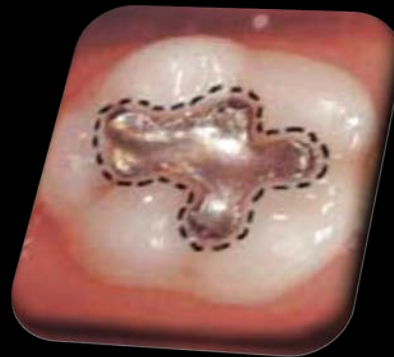
# RESTORING WITHOUT DRILLING: PARADIGM SHIFT IN DENTISTRY FOR CHILDREN



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# NO DISCLOSURES

I have no competing or conflict  
of interest and not supporting  
any specific product



# Introduction

## RESTORING WITHOUT DRILLING

- **Dentistry is a dynamic profession, continually reshape by new science, devices, techniques and materials.**
- **Numerous new treatment concepts have been suggested to arrest caries process in enamel and dentin including deep carious dentin.**



# Introduction

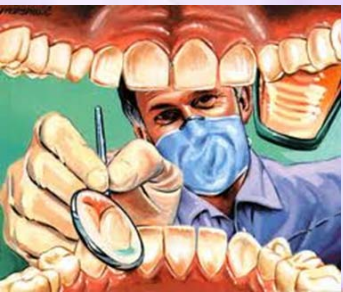
- The goal of restorative dentistry in the 21st century should be to delay and prevent placement of the initial restorations using non-operative management of caries.



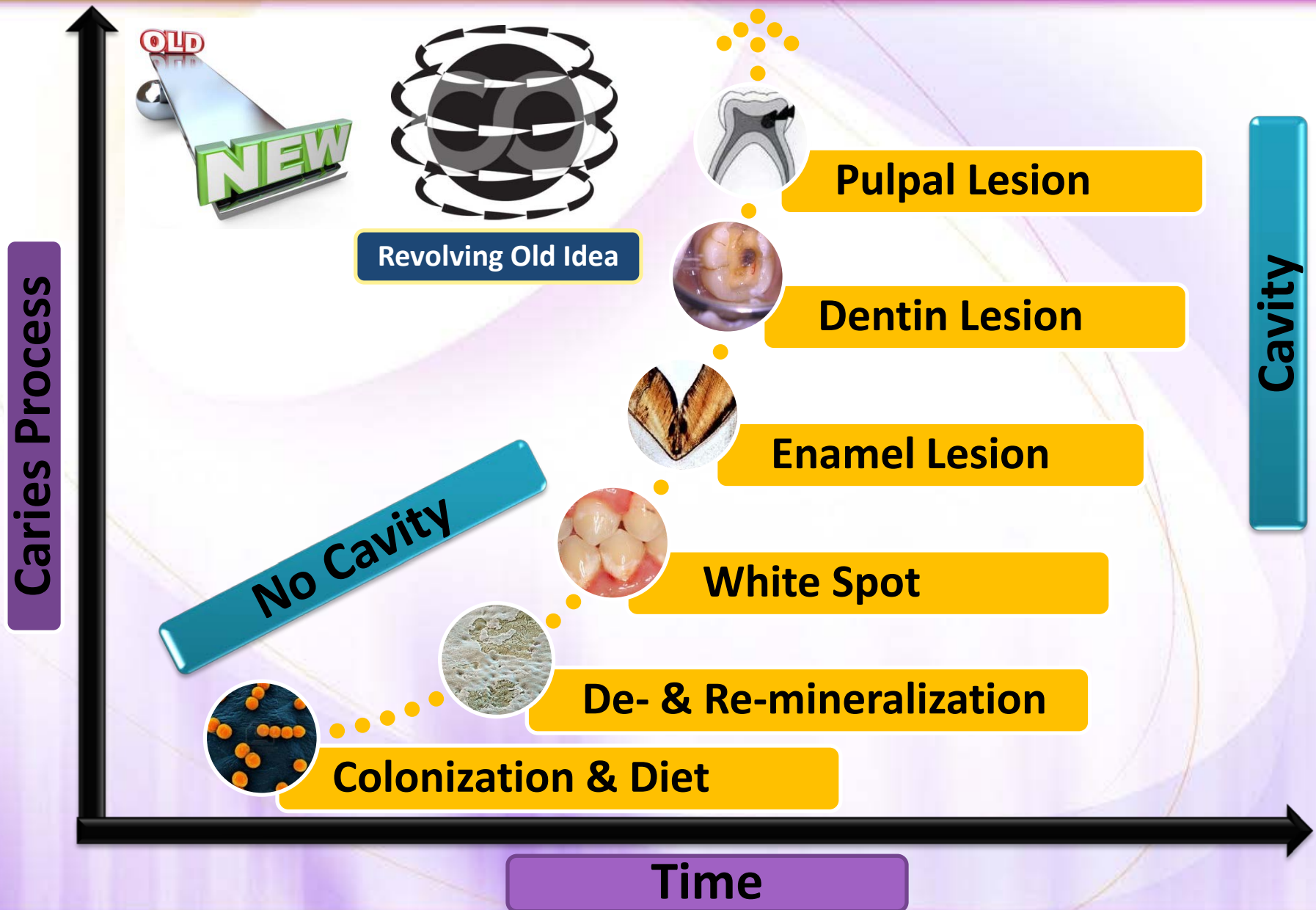


# OBJECTIVES

**This presentation will give an overview of the developments in sealing caries without drilling as well as review recent emerging techniques in caries control**



# The Caries Evolution



# Revolving Old Idea



## Caries Control

**Control all active carious lesions**

**Gross excavation**

**Filling with ZOE**

**To arrest the  
caries process**

**Aid in the  
sterilization of the  
remaining caries**

**Reduction in the  
number of oral  
microorganisms**





# Revolving Old Ideas



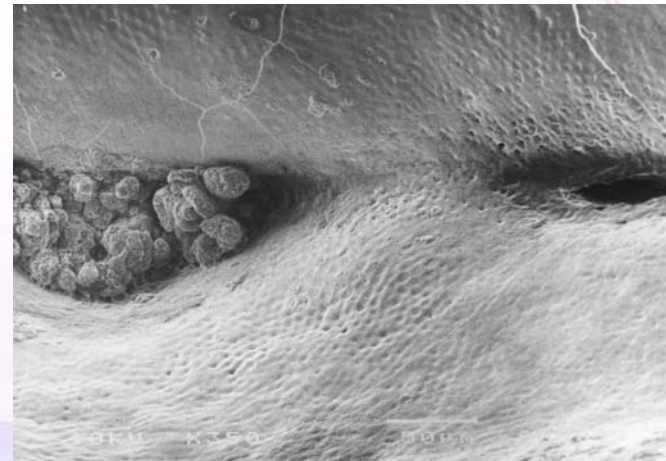
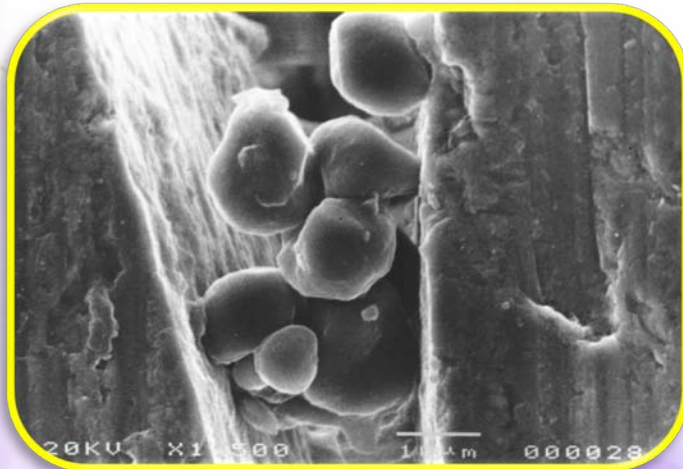
## Caries Control

- A 10-year study evaluated bonded and sealed composite restorations placed directly over frank cavitated lesions extending into dentin **arrested** the clinical progress of these lesions.

# Ecological Plaque Hypothesis


The effect of glucose and low pH on the stability of a microbial community

Bacterium	Percentage of total viable count (%)			
	pH 7.0	5.5	5.0	4.5
Streptococcus mutans	1.0	4.2	7.9	9.6



Marsh PD: Are dental diseases examples of ecological catastrophes? Microbiology 2003, 149:279-294.

# Ecological Plaque Hypothesis



**Cariogenic bacteria, once isolated from their integrity, either die or remain inactive and thus, pose no risk to the health of the tooth**

# **Applications of Caries Control**

- **Pit and Fissure Sealants**
- **Resin Infiltration - Icon**
- **Atraumatic Restorative Treatment  
(ART)/Interim Therapeutic Restorations  
(ITR)**
- **Other Methods: IPC and Hall technique**







# Pit and Fissure Sealants

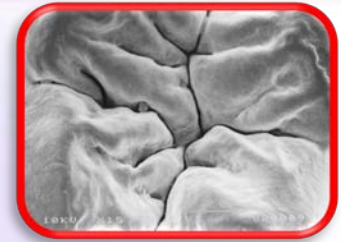
The ADA expert panel recommendation:

- Pit-and-fissure sealants could be placed on **early noncavitated carious lesions** in children and adolescents to reduce the percentage of lesions that progress..... **therapeutic sealant.**



# Pit and Fissure Sealants

## Evidence



Significant reduction in the percentage of noncavitated carious lesions that progress in children, adolescents and young adults for five years after sealant placement, compared with unsealed teeth

There are no findings that bacteria increase under sealants. Sealants lower the number of viable bacteria by at least 100-fold and reduce the number of lesions with any viable bacteria by 50 percent



# Pit and Fissure Sealants

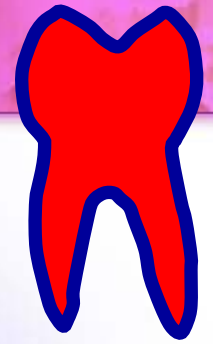
- Less than **40 percent** of U.S. dentists surveyed indicated that they sealed NCCLs in their practice i.e. **60 percent** have not adopted evidence-based clinical recommendations regarding the sealing of NCCLs







# Pit and Fissure Sealants



Past studies have shown that it takes an average of **17 years** to turn just **14%** of original research findings into changes in care that **will benefit patients**

what if everything ran on gas?



(Balas & Boren 2000)

what if everything ran on gas?



# Pit and Fissure Sealants

The ADA expert panel recommendations:

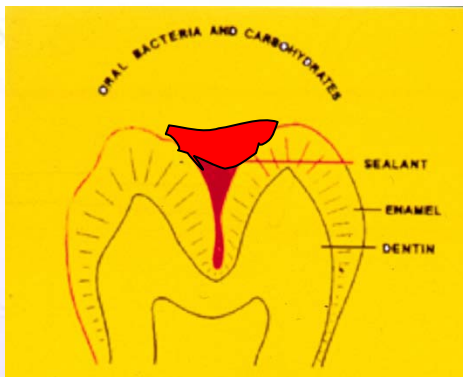
- **Monitor and reapply** sealants as needed to maximize effectiveness





# Pit and Fissure Sealants

- Overfilled fissures caused significant higher microleakage
- The fissure sealant quality may be improved by filling just to the border
- Overfilling of fissures should be avoided





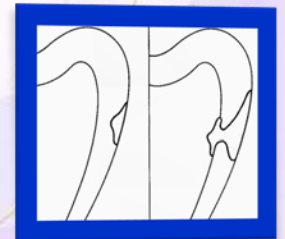
# Resin Infiltration - Icon

To arrest the progression of non-cavitated interproximal caries lesions by **penetration of a low viscosity resin** into the porous lesion body of enamel caries

## Infiltration Concept

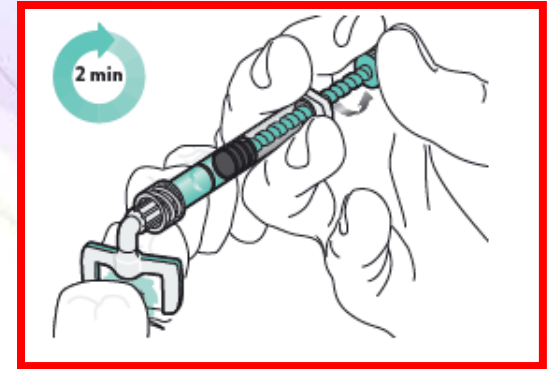
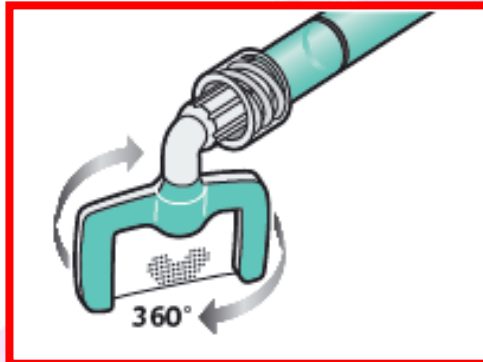


- Completed in one **15-minute** visit





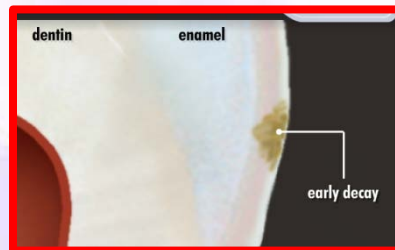
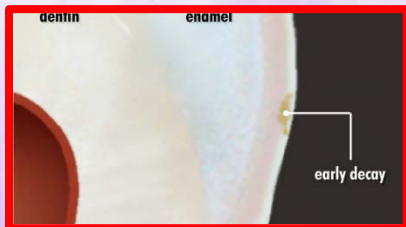
# Resin Infiltration - Icon



- A systematic review and meta-analysis on the effectiveness of sealing non-cavitated proximal caries lesions in **primary teeth** concluded that the technique of **sealing non-cavitated proximal caries** seems to be effective in **controlling proximal caries** in the short and **medium** term.

# Resin Infiltration - Icon

- A randomized split-mouth placebo-controlled clinical trial reported that resin infiltration of proximal lesions was more effective in preventing caries progression than non-operative measures alone **after 18 months**







# Atraumatic Restorative Treatment (ART) Interim Therapeutic Restorations (ITR)

- ART is recommended for **use worldwide**, not only in developing countries where resources are not readily available, but also in more **industrialized countries**.
- It is a cost-effective means of oral health care within a modern dental clinic.



# **Atraumatic Restorative Treatment (ART)**

## **Interim Therapeutic Restorations (ITR)**

**Excavation of  
carious dentin**

**Isolating  
the caries process  
from the oral  
environment**

**Using a  
cariostatic  
filling material**

**A combination of all three  
contributes to the arrest of  
the caries process**

# Atraumatic Restorative Treatment (ART) Interim Therapeutic Restorations (ITR)

**May be used to restore and prevent dental caries in**

**Young patients**

**Uncooperative patients**

**SHCNS patients**

**Situations in which traditional cavity preparation and/or placement of traditional dental restorations are not feasible**



# Atraumatic Restorative Treatment (ART)

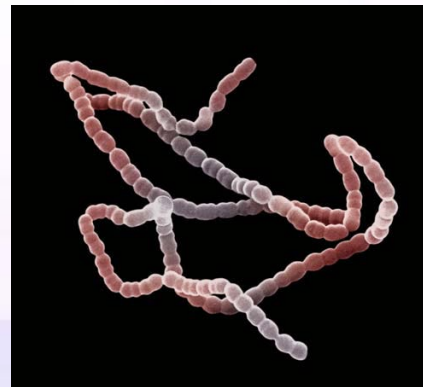
## Interim Therapeutic Restorations (ITR)

- **Hand instruments are effective for cleaning** cavitated dentin lesions. However, the size of the opening of the cavity appears to have an effect on the level of cleanliness of the cavity in occlusal surfaces.
- A cavity opening of at least **1.6 mm** is necessary for ensuring adequate removal of infected dentin.



# Atraumatic Restorative Treatment (ART) Interim Therapeutic Restorations (ITR)

- The operator is one of the main causes of failure.
- It has the greatest success when applied to single surface or small 2 surface restorations.



# Atraumatic Restorative Treatment (ART) Interim Therapeutic Restorations (ITR)

- A 6-year survival rate of the ART restorations in **permanent** teeth was **76%** and **59%** of the small and large restorations respectively and was related to the size of the restoration.



# Atraumatic Restorative Treatment (ART) Interim Therapeutic Restorations (ITR)

- The 10-year survival rate in posterior **permanent** teeth of single- and multiple-surface ART restorations were **86.5%** and **57.6%**, respectively.
- The **primary causes of failure** were **total loss (9.3%)** and **marginal defects (5.4%)**.







# The Hall Technique

The SSC is cemented in place without any tooth preparation or local anesthesia, and carious tooth tissue is not removed, but sealed into the tooth by the SSC and cement, thus isolating it from the rest of the mouth



# The Hall Technique

**Occlusion corrected in 30 days!!!**



**There is inconclusive evidence to support use of this technique and it is controversial subject**



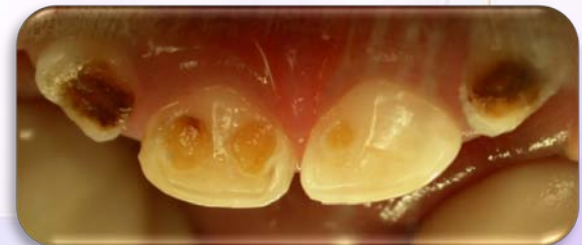
# Indirect Pulp Treatment

**A study reported that IPT performed in primary and permanent teeth of young patients may result in a high 3-year survival rate ... 96% and 93% respectively**



# Indirect Pulp Treatment

**A systematic review compared the effect of incomplete versus complete caries removal on pulpal health demonstrated an overall benefit to pulpal health when caries was only **partially removed****



# Indirect Pulp Treatment

- Glass ionomer used for caries control for **1 to 3 months**, before vital pulp therapy, improved the vital pulp therapy success .... **92%** success rate vs. a **79%** success rate in teeth not having a GIC CC restoration.



## Caries Control



# CARIES EXCAVATION

Paradigm Shift



**Nonrestorative Caries  
Treatment (NRCT)**

removed

**Traditional Way**

**NO CARIES REMOVAL + RESTORATION**



# CARIES EXCAVATION

## Partial vs. Complete Excavation



**Reduce  
Excavation  
Time**

**Less Pulp  
Exposures**

**Benefit to  
Pulpal  
Health**

**Reduce  
Number of  
Remaining  
Bacteria**

**PARTIAL  
EXCAVATION  
vs.**

**Less Post-  
operative  
Pain**

**COMPLETE EXCAVATION**

# CARIES EXCAVATION

## Paradigm Shift



**Complete  
Excavation -  
Conventional  
Restorations (CR)**

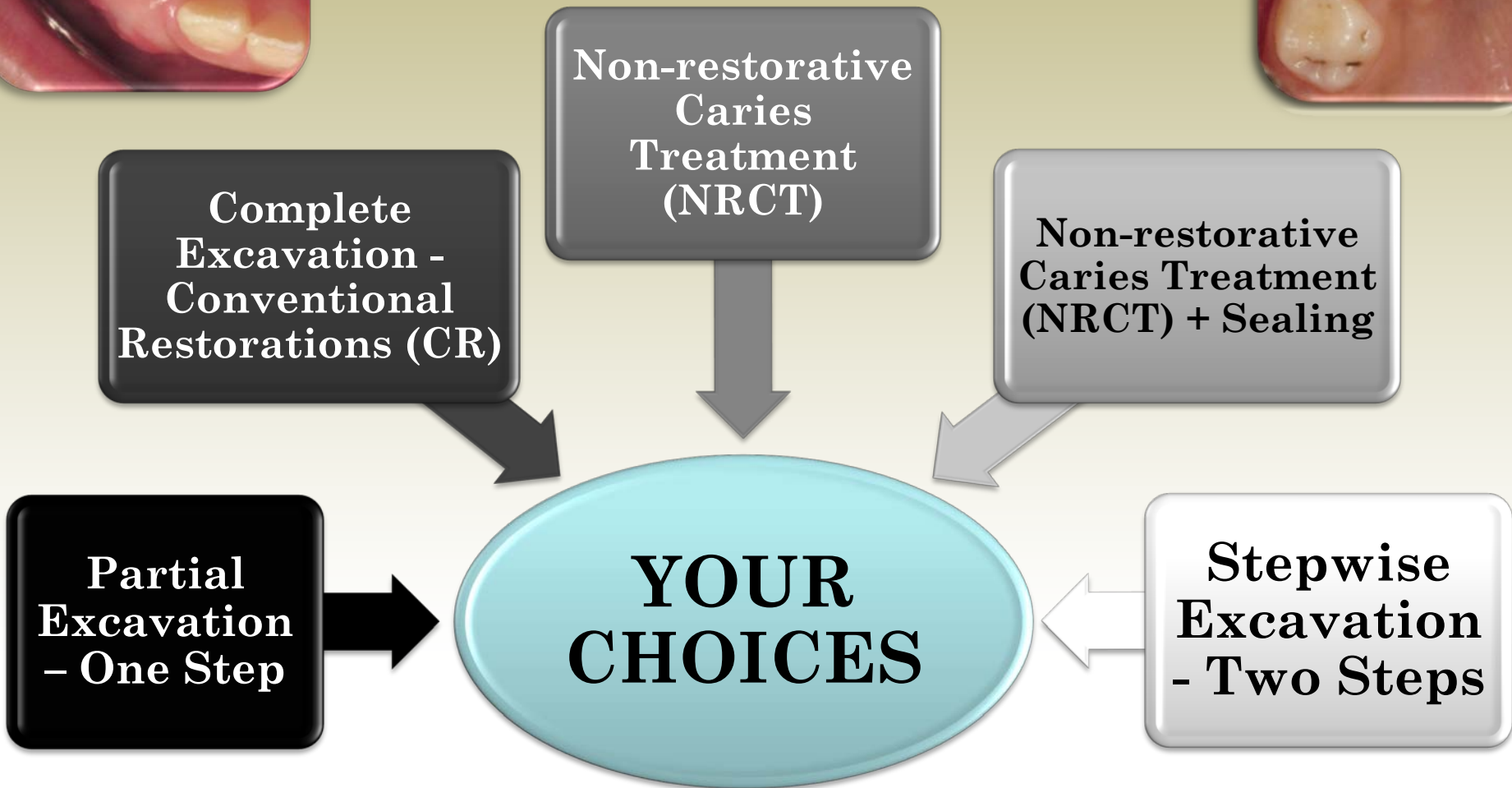
**Non-restorative  
Caries  
Treatment  
(NRCT)**

**Non-restorative  
Caries Treatment  
(NRCT) + Sealing**

**Partial  
Excavation  
- One Step**

**YOUR  
CHOICES**

**Stepwise  
Excavation  
- Two Steps**





# Carries Management Strategies



**ALWAYS  
CONSIDER  
OPTIONS FOR  
MANAGEMENT  
AND TREATMENT**

Puzzles



yes  
no  
maybe



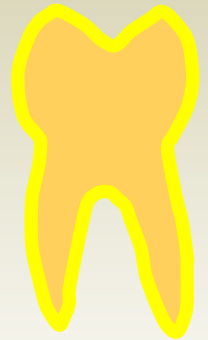


# Evidence Based Decision Making

**Scientific  
Evidence**



**Clinical  
Circumstances**



**Experience &  
Judgment**

**Parent &  
Patient  
Preferences**



A close-up photograph of a dental procedure on a patient's teeth. The image shows several teeth with dark, possibly amalgam or composite, restorations. A blue grid pattern is overlaid on the entire image. In the center, there is a dark blue rounded rectangle containing the text "Clinical Decisions" in white. The background is a reddish-pink color, likely the patient's tongue or cheek.

# **Clinical Decisions**



# SUMMARY





# SUMMARY



⇒ Key factors to clinical **SUCCESS**



**Early recognition of caries and intervention which are critical**

**Appropriate Procedure Selection**

**Appropriate Patient Selection**



# SUMMARY

**Dental caries is a preventable and reversible infectious disease**

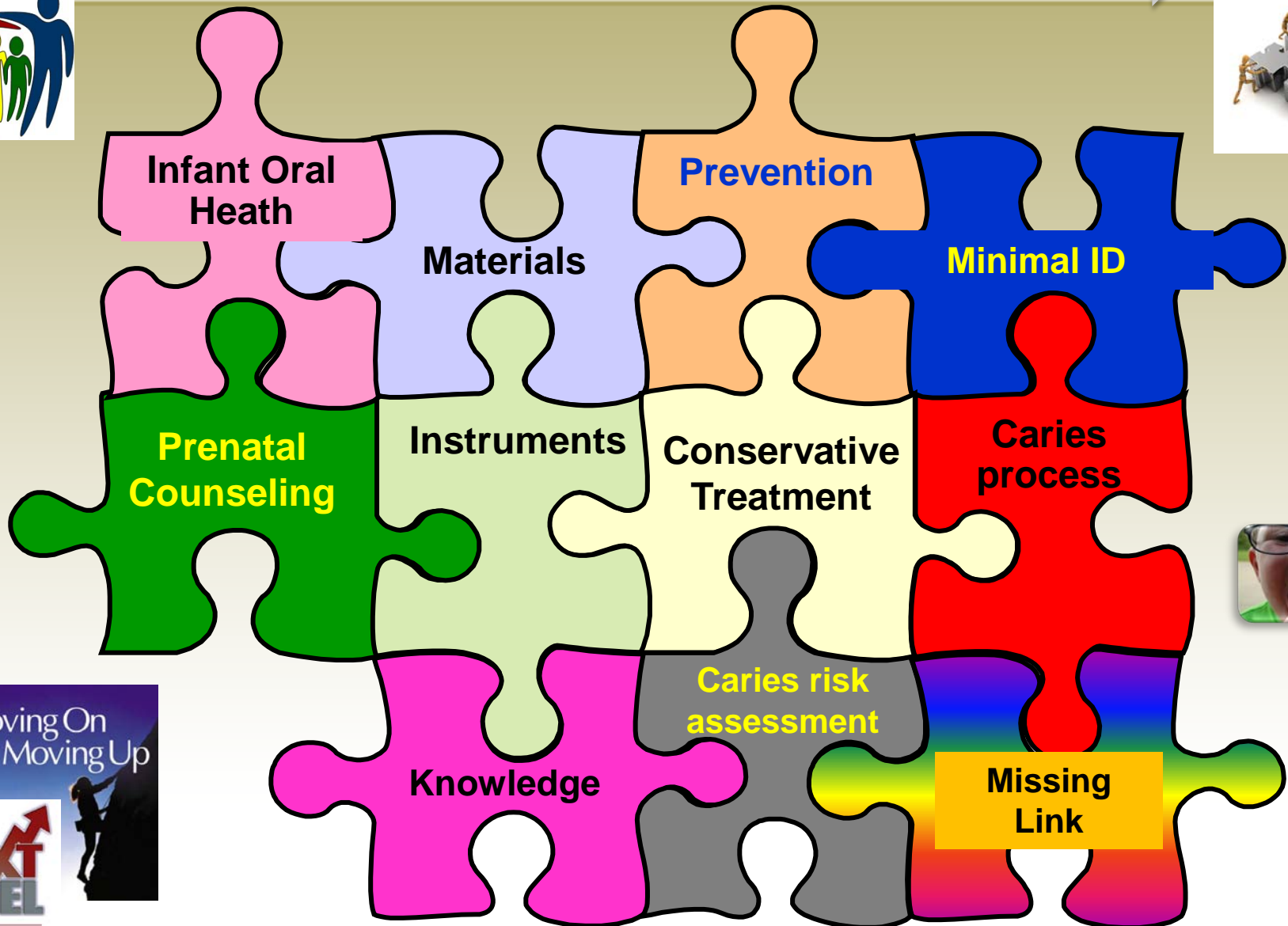
**Be prepared and start thinking about caries management in the 21st century**

**It's what you learn after you know it all that counts**

*Attributed to Harry S. Truman*

**Building Better Oral Health for Children**

# Your Tools in Managing Caries



Moving On  
and Moving Up



