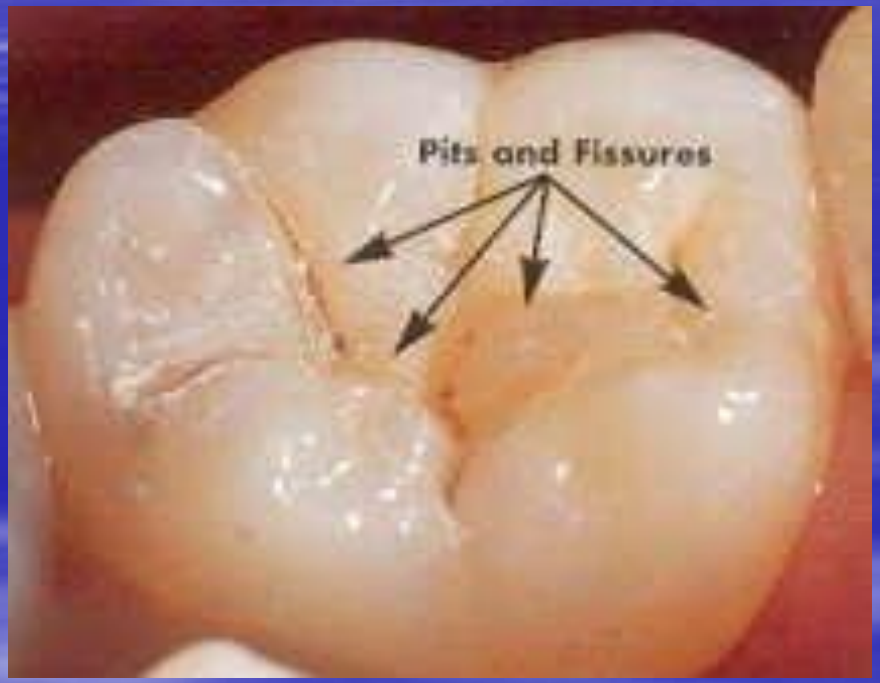
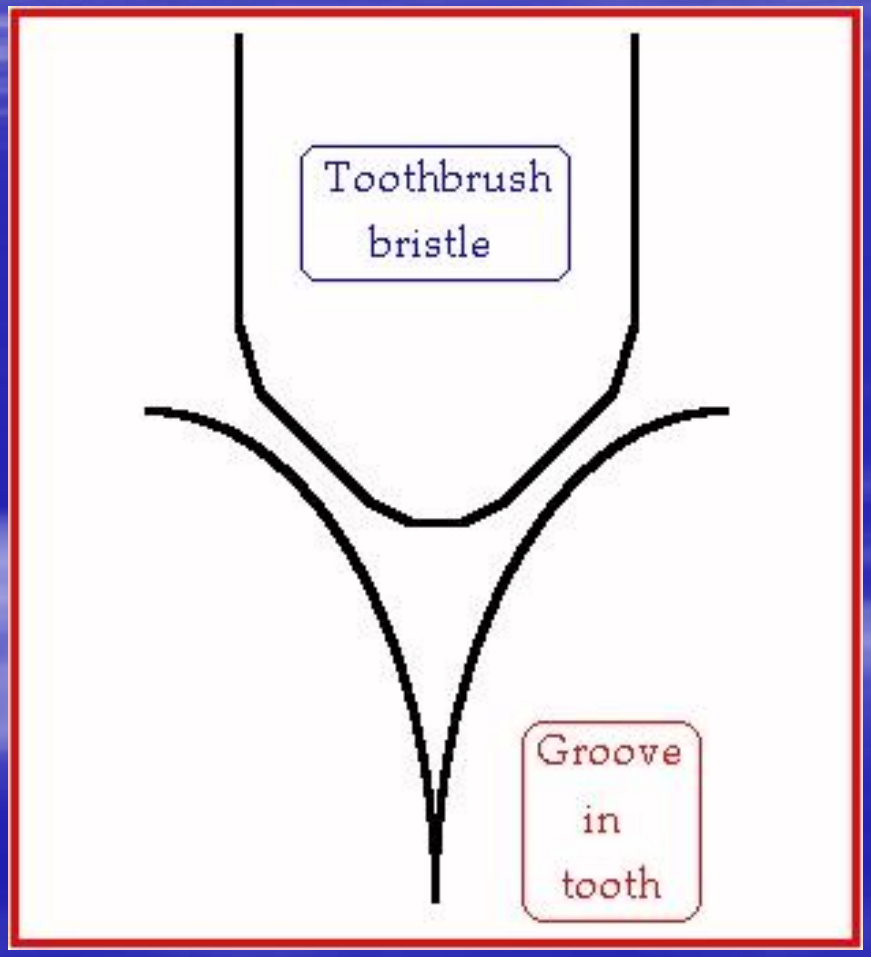
Pit and Fissure Sealants, Preventive resin restoration

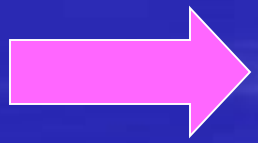
Dept of Pediatric dentistry


Pits and Fissures

Introduction:

- Almost 9 out of every 10 cavities in children occur on the biting surfaces of the teeth.
- There are two reasons for this:
- Fluoride is not very effective in these pit and fissure areas
- The grooves in some teeth are often so deep as to prevent the bristles of a brush from cleaning the area of food and bacteria.


Toothbrush bristle
Groove in tooth



If left untreated,
this molar

Can become this !

Historic development of preventive techniques:

- 1923 – Hyatt – “Prophylactic Odontotomy”
- 1929 – Bodecker – “Fissures Eradication”
- 1942 - Klien and Knutson- Ammonical $AgNO_3$
- 1950 - Zinc chloride, Potassium ferricyanide
- 1955 – Bunocore – “Acid Etching of Enamel”
- Mid 1960’s – “Cyanoacrylates”
- 1965 – Bowen – “BIS-GMA”

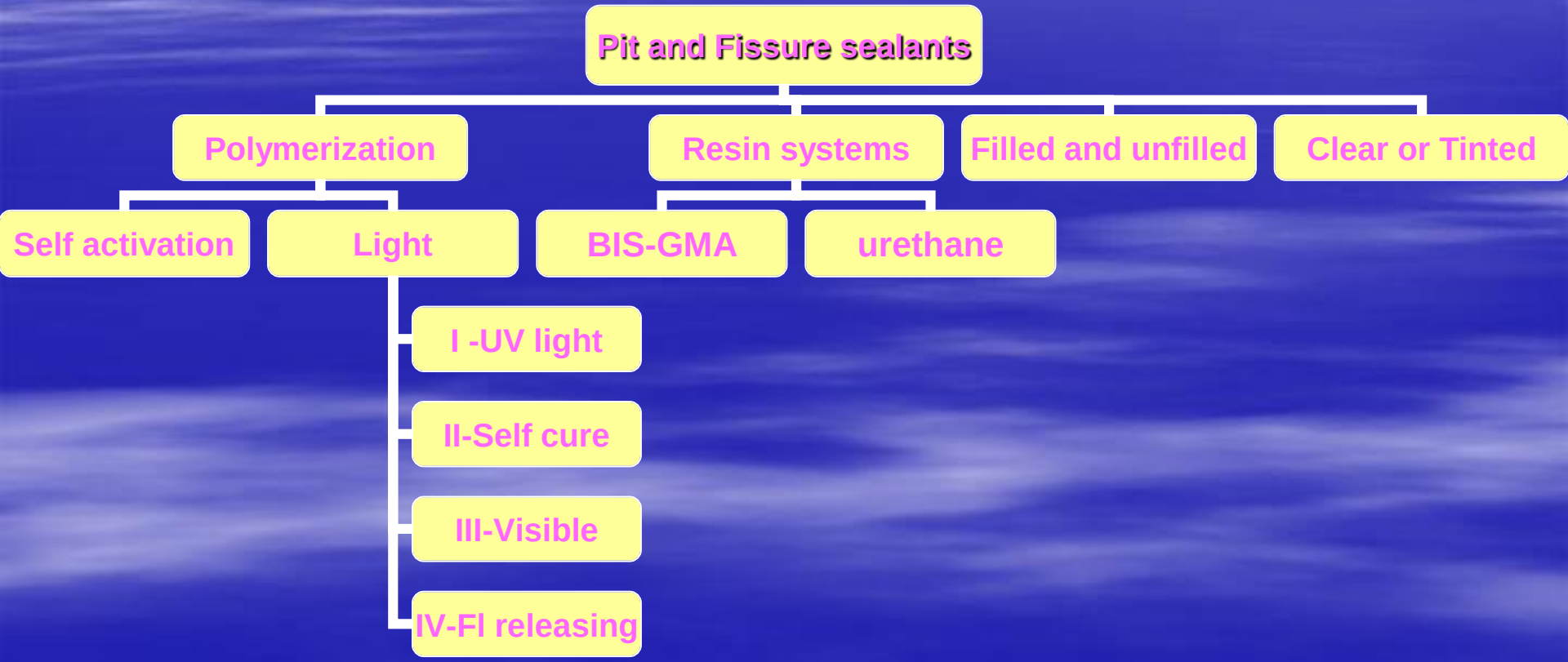
Definition:

- *“A fissure sealant is a material that is placed in the pits and fissures of teeth in order to prevent or arrest the development of dental caries”.*

How do they work?

- They work in two ways to prevent caries development:
- Keeps substrate (i.e. food and bacteria) out of deep pits, grooves and fissures on the teeth
- Create an anaerobic environment.

Classification of Pit and Fissure sealants (Mitchell and Gordon-1990):



Ideal requisites: Brauer,1978

- Low Viscosity
- Biocompatible
- Adequate working time
- Good and prolonged adhesion
- Low sorption and solubility
- Resistance to wear
- Cariostatic action

Age ranges for Sealant application:

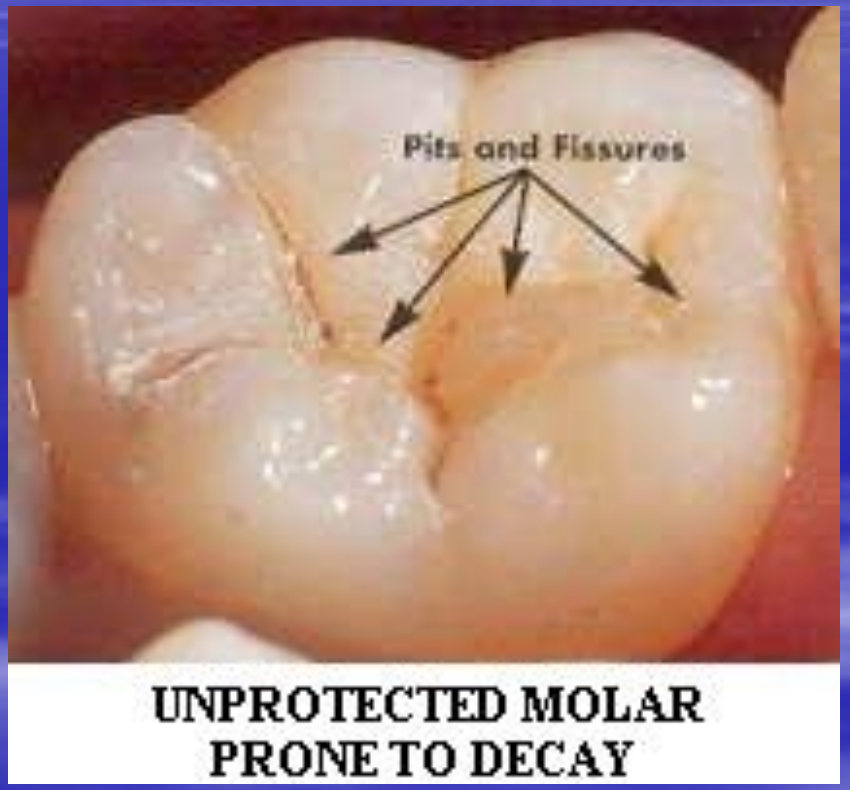
- 3-4 yrs
- 6-7 yrs
- 11-13 yrs

Simonsen 1983- Triaging patients:

- Group-I: Caries-free patients judge at no risk to decay.
- Group-II: moderate risk.
- Group-III: high risk.

Determine the Caries Risk:

- Age
- Past caries experience.
- Fluoride history
- Dietary history
- Oral hygiene
- Fissure anatomy



Morphology of Fissures: Nango(1960)

- “V” type
- “U” type
- “I” type
- “K” type

Indications:

- Newly erupted (< 4 yrs) - Primary molars and Permanent molars and Premolars with sticky grooves.
- Stained Pit and Fissures with minimum decalcification.
- Children with special needs.

  Eg: Medically compromised, Handicap

Contraindications:

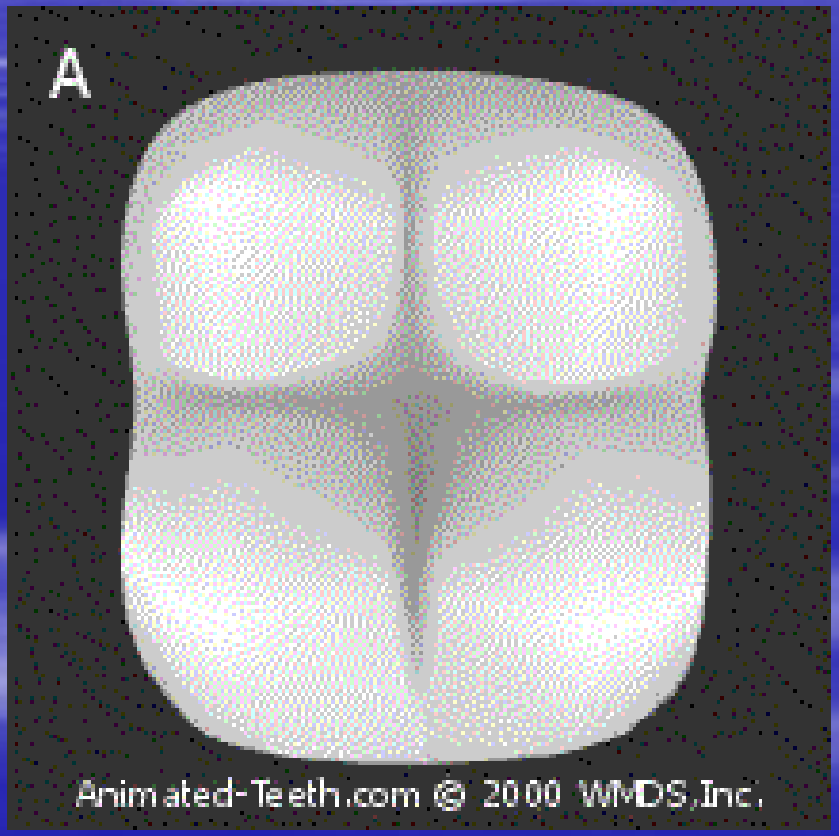
- Individual with no previous caries experience
- Interproximal caries.
- Wide and self cleansable pit and fissures
- Partially erupted
- Pit and fissures have remained caries free for > 4 yrs.

Clinical considerations

- When indicated, sealants should be placed as soon as possible since the tooth is most caries susceptible during the post-eruption period.
- The choice between resin/composite and glass-ionomer sealants should be based on adequacy of moisture control.
- Where there is a real doubt about the caries status of a susceptible site on clinical examination, e.g. a stained fissure, then a bitewing radiograph should be obtained.
- If the lesion extends into dentine after removal of staining then a sealant restoration ("preventive resin/glass ionomer restoration") may be placed.

Sealant Application Procedure

- Clean the tooth surface.
- Isolate and dry the tooth.
- Etch the enamel.
- Wash and dry the enamel surface.
- Apply the resin.
- Allow the resin to polymerize.
- Check the sealant.
- Check the occlusion.
- Recall the patient after 3 mos.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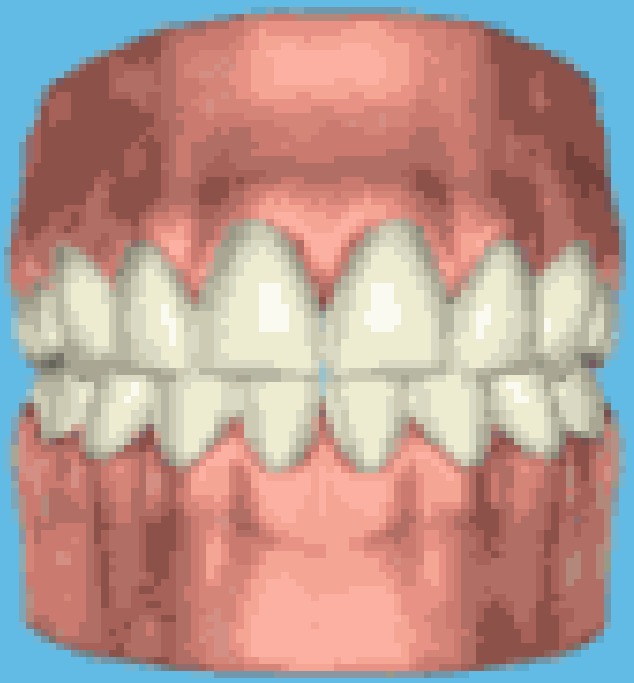


Follow up and review

- All sealed surfaces should be regularly monitored clinically and radiographically.
- Defective sealants and/or preventive resin or glass ionomer restorations should be investigated .

Preventive resin restoration or Sealed restoration:

- Simonsen and Stallard 1977
- Natural extension of use of occlusal sealants.
- Integrates preventive approach of sealant therapy for caries susceptible pits and fissure.
- With therapeutic restoration of incipient caries with composite resin on same occlusal surface .

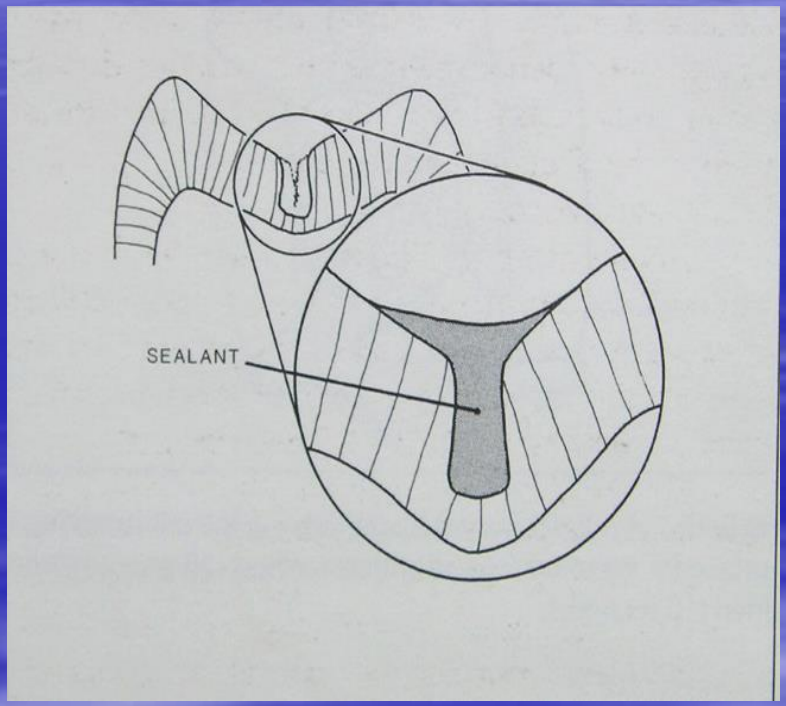
Types of PRR: Simonsen 1978

- Type-A
- Type-B
- Type-C

Type-A

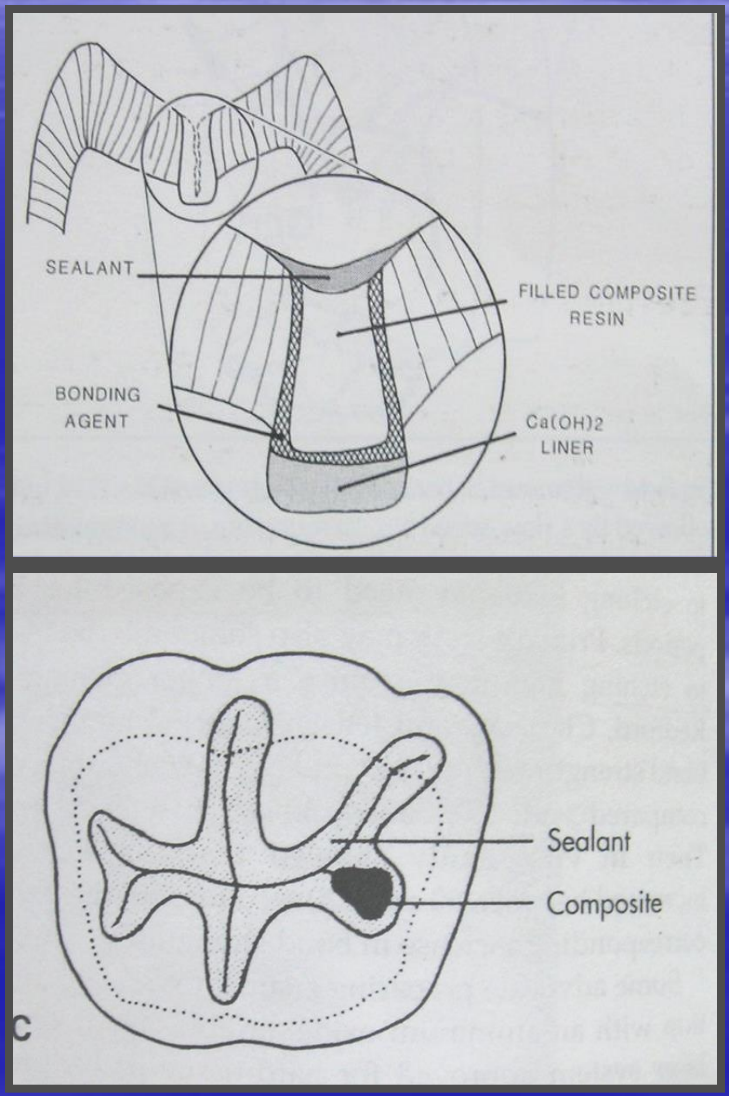
- Suspicious pits and fissures where caries removal is limited to enamel
- Slow-speed round bur

- Unfilled sealant used



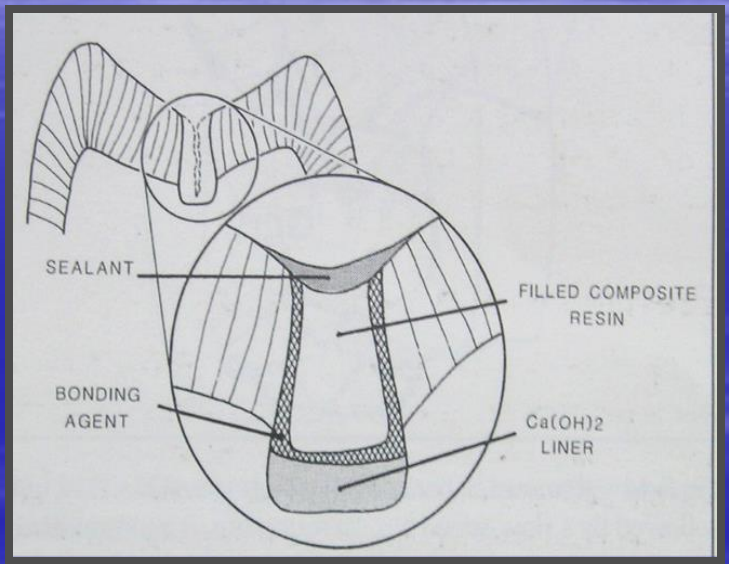
Type-B

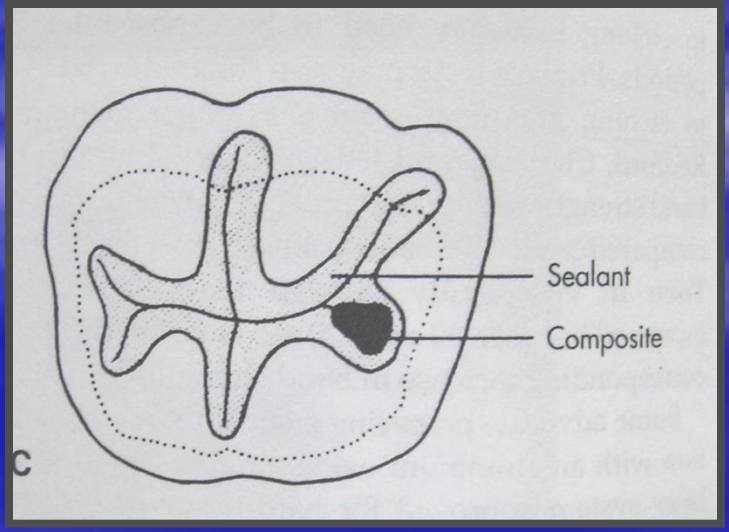
- Small Incipient lesion confined to dentin.
- Prepared by a size-2 round bur
- Diluted composite resin



Type-C

- Larger and deeper caries in dentin.
- LA is required.
- Large size round bur.
- Filled composite resin.





Advantages:

- Minimal cavity preparation- prevents removal of sound tooth structure.
- Seals active carious lesion thereby preventing tooth destruction.
- Loss of restoration and subsequent replacement is less invasive.

ThankYou