Restorative Materials in Pediatric Dentistry

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Preventive Materials

1. Fluoride gels, foam and varnish:
- Used for remineralisation of decalcified enamel and incipient caries.
2. Sealants:
- Indicated for preventing and arresting incipient lesions.
- Available as clear or white, filled or unfilled, containing Fluoride or not.

Resin based composites(RBC)

Resin matrix (Bis-GMA) with inorganic filler particles.

1. Filler content-
   Filled vs Unfilled
   Flowable vs packable
   Anterior vs posterior composite
2. Particle size-
   macro, microfilled and hybrids

Resin Restorations

- Steps:
- Etch, wash, dry or dessicate?
- Enamel and Dentin adhesives
- Composite selection and placement
- Curing tools and techniques

Resin Restorations

- Disadvantages:

1. Polymerization shrinkage
2. Technique sensitive
3. Performance of posterior composites in large, stress bearing preparations is questionable

Dentin/Enamel adhesives in Pediatric Dentistry

- Dentin bonding agents or Primers:
- Smear layer
- Etch
- Hydrophillic and hydrophobic component (HEMA)
- Enamel adhesives or bonding agents:
- Hydrophobic resin such as Bis-GMA
- Hybrid layer- copolymerized layer of primer, bonding resin and collagen

Dentin/Enamel adhesives in Pediatric Dentistry

1. 3-step total etch
2. Total etch using prime and bond
3. Self etch primers with bonding agent
4. All-in-one adhesives e.g.- prompt L-pops

Glass Ionomer cements

- Fluorosilicate glass powder(base) combined with a water soluble polymer(acid)
  e.g. - Ketac cement
- Resin-modified glass ionomer cements:
  are glass ionomers with a light polymerised resin component.
  e.g.- Vitrebond and Vitremer

Resin-modified glass ionomers

Advantages:

1. Increased mechanical properties
2. Physiochemically bonds to tooth structure
3. Biocompatible, moisture forgiving
4. Similar coefficient of thermal expansion as dentin therefore a good dentin replacement material. (sandwich technique)
5. Ion lechability - Fluoride release(anticariogenic action)
6. Minimal polymerization shrinkage

Compomers

- Polyacid-modified, resin based composite with fluoride releasing glass fillers.
  e.g.- compoglass, dyract
- Better results after etch and bond
- Good mechanical properties and polishability

Amalgam

- No polymerization shrinkage
- Moisture forgiving
- Excellent mechanical properties
- Mercury toxicity
- Esthetics

SSC- Primary and Permanent

- Full coverage, metallic, definative restorations
- Available as: pretrimmed (Unitek), precontoured and festooned (Ni- Chro ION crowns)
- Durable and cost effective

Research trends

- Polymerization shrinkage
- Mechanical properties
- More 'forgiving' materials

In summary….

" Primary teeth are a temporary dentition with known life expectancies of each tooth. By matching the 'right' restoration with the expected lifespan of the tooth, we can succeed in providing a 'permanent' restoration that will never have to be replaced."