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

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.”

Research trends

- Polymerization shrinkage
- Mechanical properties
- More ‘forgiving’ materials