Tooth Hypomineralization & Molar Incisor Hypomineralization (MIH)

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- What is tooth hypomineralization / MIH?
  - MIH is a common developmental condition (1 in 7 children) affecting primarily one or more first permanent molars.
  - The central incisors may be affected as well, but this usually occurs less often.
  - Hypomineralization of the second baby molars or canines may also occur.
  - Great varieties in severity exist, ranging from mild opacities to rapid posteruptive enamel breakdown.
    - Various color irregularities in the opacities range from white, yellow, orange to brown.
- What causes tooth hypomineralization / MIH?
  - Currently, the etiology of MIH is still unknown.
  - Some correlation exists with prenatal, perinatal and postnatal illness, but sufficient evidence is still lacking.
  - Most recently, it has been hypothesized that high plasma albumin levels may contribute to hypomineralized enamel, which occur during times of normal childhood illnesses and when dehydrated.
- What do these teeth look like?
  - Demarcated opacities, ranging from creamy white to yellow, orange, and brown discoloration
  - Defective enamel has normal thickness, but poor quality (more porosities)
  - Lesions may occur asymmetrically
  - Lesions of central incisors are usually milder, but they can sometimes be esthetically concerning

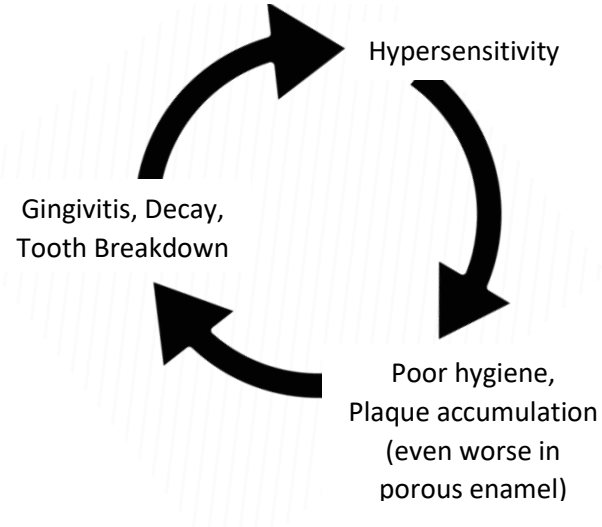
Mild MIH
Courtesy of Prof. van Amerongen, the Netherlands

Moderate MIH
Courtesy of Dr. Jeanette MacLean, USA

Severe MIH
Courtesy of Dr. Jeanette MacLean, USA

Affected incisors as part of MIH
Courtesy of Prof. Baroni, Italy

- Symptoms:
  - Hypersensitivity
  - Decreased response to local anesthesia
  - More plaque retentive
  - Rapid caries progression
  - Posteruptive breakdown
- Clinical management of MIH is challenging due to:
  - Hypersensitivity
  - Rapid development of dental caries in affected teeth
  - Difficulty in achieving anesthesia
  - Limited cooperation of the young child
  - Repeated marginal breakdown of restorations



Often, an increased number of dental visits is required. Children with MIH often develop dental anxiety as a result of invasive and frequent dental experiences at a young age.

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- Treatment options:
  - Short term restoration/prevention
    - Sealant (Traditional or low viscosity glass ionomer)
      1. Glass ionomer sealants can bond chemically in a moist environment
      2. Sealants are preferred first line treatment to prevent decay and tooth breakdown



  - Long term restorations
    - High viscosity glass ionomer or composite (white filling)
    - SMART Technique (Silver diamine fluoride followed by high viscosity glass ionomer)
    - Stainless steel crown (until growth is complete, then replace with white crown)




1. White filling
2. "SMART" Technique
3. Stainless Steel Crown

- Alternative considerations: "First molar extraction, Second molar substitution"
  - In certain orthodontic conditions, it might be indicated to extract severely affected permanent first molars.
  - The ideal moment to extract a first molar is when the furcation of the second molar starts to calcify, usually around age 8-10, and when the presence of third molars can be confirmed.
  - Extracting at that moment favors spontaneous migration of the second molar.
  - Results are usually better in the upper arch than in the lower arch.

Example: Age 7 (consult) Age 9 (post-extractions) Age 11 (2 year follow-up)