

QUEST Symposium on Caries in AI/AN Children
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QUEST Enamel Hypoplasia

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Enamel Defects

“**Enamel Defects** are disturbances in the process of apposition and mineralization of dental enamel and may be manifested as enamel hypoplasias or opacities.”

Hypoplasia, No Dentin Exposure

“Defect involving the surface of the enamel associated with a reduced localized thickness of enamel without dentinal exposure.”

Oliviera et al, 2006, *Caries Research* **40**:296-302



Normal



Demarcated opacity



Diffuse opacity



Demarcated + diffuse opacity



Hypoplasia



Demarcated opacity + hypoplasia



Diffuse opacity + hypoplasia



Demarcated + diffuse opacity + hypoplasia

Color version available online

- A few studies have suggested that enamel hypoplasia, particularly in anterior teeth, is associated with ECC

Li Y, Navia JM, Bian JY. *Caries Research* 1996; 30: 8-15.

Oliveira AFB, Chaves AMB, Rosenblatt A. *Caries Research* 2006; 40: 296-302.

Targino AGR, Rosenblatt A, Oliveira AF, Chaves AMB, Santos VE. *Oral Diseases* 2010. (

- The mechanism is believed to involve preferential colonization of mutans streptococci in hypoplastic defects

Li Y, Navia JM, Caufield PW. *Arch Oral Biol* 1994; 39: 1057-62.

- Hypoplasia in primary anterior teeth is associated with prenatal smoking, excessive weight gain, low birth weight, prematurity and post-natal measles

Needleman HL, Allred E, Bellinger D, Leviton A, Rabinowitz M, Iverson K. *Pediatr Dent* 1992; 14: 158-66.

The reason for this study

- Native American children have high ECC rates
- Indian Health Services (IHS) and other serving these community note rampant caries in some cases with underlying signs of enamel hypoplasia
- No data on prevalence of enamel defects in these communities (before caries)
- Early detection of enamel defects is critical to understand role in ECC etiology and to help implement effective preventive strategies with these children
 - *Accurate* identification of enamel defects required BEFORE caries develops

Objectives

- To evaluate the ability of pediatric dentists to accurately identify and classify developmental defects of enamel in the primary dentition using simple criteria
- In the future, to determine if lay people are able to identify enamel defects on primary dentition



Modified DDE Index

The Developmental Defects of Enamel (DDE) Index in which the type (opacity, hypoplasia, discoloration), number (single and multiple), demarcation (demarcated and diffuse), and location of defects on the buccal and lingual surfaces of teeth could be recorded (FDI, 1982).

Modified Developmental Defects of Enamel (DDE) Index for use in screening surveys (Clarkson and O'Mullane, 1989)

	Code
Normal	0
Demarcated opacity	1
Diffuse opacity	2
Hypoplasia	3
Other defects	4

Study Design

- Clinical photographs in a survey design to be sent to a panel of experts to determine scores for images
 - 16-20 images; anterior and posterior teeth
 - Utilizing Modified DDE Index
 - Goal kappa > 0.8
- Utilize images of primary dentition from populations of Native American children seen at Indian Health Service dental clinics (PROVED TO BE VERY DIFFICULT)

Study Design

- Once experts establish scores, the survey will then be sent to pediatric dentists (IHS, others?) to identify developmental defects of enamel
 - ≥ 50 pediatric dentists
 - Goal kappa > 0.8

Current Progress

- Database of images in progress
 - ~ 20 images identified for use
 - ~ 20 images considered possible options
- Identify new student to lead project

Thank you!