

Dental Health in Children with 22q – Info for Dentists

22q11.2 Deletion Syndrome

22q11.2 deletion syndrome (**22q11.2DS** or simply **22q**) occurs when a person is missing a piece of DNA on the short arm of chromosome 22. Individuals with this syndrome often deal with many major medical conditions. Please see the box on the right for conditions that affect your patient.

22q happens in about 1 in 2148 live births. It was known by multiple names, such as DiGeorge syndrome and velocardiofacial syndrome. 22q is very under-recognized because of its wide variety of symptoms and levels of severity. Each child with 22q is different, even among members of the same family. For more information about this syndrome, please visit the website of the International 22q11.2 Foundation:

www.22q.org

_____ has 22q with these conditions:

Parents: Please circle all the terms that apply and write down any additional problems.

| | |
|---------------------------------|------------------------|
| Congenital heart defects | Impaired vision |
| Frequent infections | Impaired hearing |
| Thrombocytopenia | Developmental delay |
| Allergies | Behavioral differences |
| Asthma | Anxiety |
| Arthritis | Scoliosis |
| Hypocalcemia/Hypoparathyroidism | |
| Hypothyroidism | |
| Seizures | |
| Palatal differences | _____ |
| Swallowing differences | _____ |
| Gastroesophageal reflux | _____ |
| Renal agenesis | _____ |
| Sleep apnea | _____ |

Common Teeth Problems in Children with 22q

Parents are “struggling in vain for good oral health in their child”. See [Klingberg et al. \(2010\)](#).

Cavities

[Klingberg et al. \(2002\)](#) found that 53% (28/53) of patients with 22q had cavities, with 15 individuals having severe caries. Many children with 22q have poor teeth even when they have good cleaning habits. Enamel hypoplasia and hypomineralization may contribute to the problem.

Enamel hypoplasia

[Klingberg et al. \(2002\)](#) found about 30% (16/53) of patients with 22q had enamel hypoplasia.

[Klingberg et al. \(2005\)](#) showed that the surface at the bottom of the enamel hypoplasia was hypomineralized and rougher than normal, suggesting that ameloblasts were unable to finish the maturation of the enamel.

Hypomineralization

[Klingberg et al. \(2002\)](#) and [Nordgarden et al. \(2012\)](#) found hypomineralization in 43% (23/53) and 58% (29/50) of individuals with 22q, respectively.

[Klingberg et al. \(2005\)](#) showed that hypomineralized sections of the enamel had less densely-packed prisms with a smooth structure, and the levels of calcium and phosphate were decreased. The enamel had a lower concentration of magnesium and a more porous structure overall.

Other reported problems

- | | |
|-------------------------------|------------------------|
| Teeth discoloration | Malocclusion |
| Hypodontia / Agenesis | Dental crowding |
| Aberrant tooth shape | Impaction |
| Delayed tooth eruption | |

Keeping teeth healthy can be challenging for children with 22q. Conditions that weaken the enamel are common, making it easier to have cavities.

Dental Health in Children with 22q – Info for Dentists (continued)

What Makes It Harder for Kids with 22q to Have Healthy Teeth

- Some children are unable to take care of their teeth, or they may not understand the importance of dental health.
- Some children have major (even life-threatening) health issues, and parents have no choice but to focus on those problems first. Dental health may be down prioritized.
- Parents sometimes give sweets simply because the children need to eat something after a surgery. Surgeries are unfortunately a common part of life for these children.
- Dental health can be a stressor and a financial burden in families with children with disabilities.

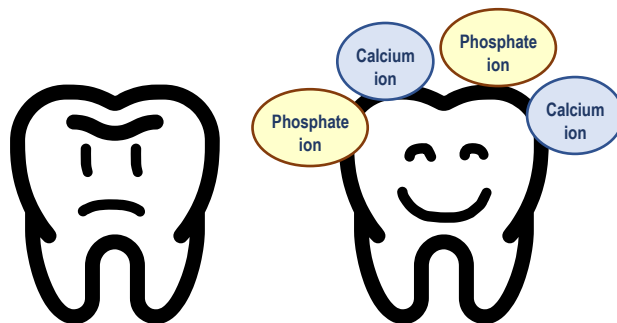
Dental Health & Medical Conditions in Kids with 22q

- [Klingberg et al. \(2002\)](#) showed that enamel hypoplasia was associated with preterm birth and congenital heart malformation, while hypomineralization was associated with frequent infections.
- Data from [Klingberg et al. \(2005\)](#) pointed to a close relationship between the number of medical problems and enamel disturbances in children with 22q.
- [Nordgarden et al. \(2012\)](#) found no correlation between dental and medical conditions, except that patients who had congenital cardiac anomalies had fewer enamel disturbances and hypomineralization than those without.

Things Dentists Can Do to Help Children with 22q

Prevention is key! Children (and adults) with 22q already have to deal with many health issues. A focus on **dental health promotion** and **cavity prevention** is very important.

- Help your patient **decrease demineralization** and **increase remineralization** of the enamel
 - Children with 22q often have conditions that weaken the enamel.
- The patient should have **dental appointments at least twice a year**.
- Allow for **enough time for the appointment**.
- Find out more about the other health conditions that the patient is dealing with, and **treat dental problems as part of the whole** medical diagnosis.
- **Support and understand** the family. **Avoid blaming the parents or the child**.
 - Having a child with multiple major medical conditions is very challenging and overwhelming.
 - To see the parents' perspectives, please read the article by [Klingberg et al. \(2010\)](#).



Resources for Dental Professionals

[Candelo et al. \(2021\)](#) The Oral Health of Patients with DiGeorge Syndrome (22q11) Microdeletion: A Case Report. Appl Clin Genet. 1;14:267-277.

[Klingberg et al. \(2002\)](#) Oral manifestations in 22q11 deletion syndrome. Int J Paediatr Dent. 12(1):14-23.

[Klingberg et al. \(2005\)](#) Morphological appearance and chemical composition of enamel in primary teeth from patients with 22q11 deletion syndrome. Eur J Oral Sci 113(4):303-11.

[Klingberg et al. \(2010\)](#) Oral health and 22q11 deletion syndrome: thoughts and experiences from the parents' perspectives. Int J Paediatr Dent. 20(4):283-92.

[Nordgarden et al. \(2012\)](#) Dental developmental disturbances in 50 individuals with the 22q11.2 deletion syndrome; relation to medical conditions? Acta Odontol Scand. 70(3):194-201