

# Managing Tooth Decay In Children With Chronic Diseases

Poor oral health puts kids with special needs at risk

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If we're lucky, life is a chronic condition! Chronic is derived from the ancient Greek word "chronos" meaning time, but in the medical sense the word has come to be associated with a variety of long-standing diseases and disorders. Almost all children endure a variety of different health problems during infancy and childhood, but for most the problems are mild, they come and go, and they do not interfere with daily life and development. In fact, it can be argued that childhood illnesses play a role in the development of the immune (resistance) system. However, for some children with chronic health conditions (also known as children with special healthcare needs), everyday life is affected throughout childhood and beyond.

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Dental care is the most neglected healthcare need of children and adolescents who have chronic conditions and diseases. Understanding children's medical conditions is

crucial to pediatric dentistry, particularly when advances in therapy and technology have extended the lives of more children and adolescents with chronic diseases. Primary (baby) teeth are important to all children for normal growth and development, for eating, speech, and normal social development. In addition, they act as space-holders for permanent adult teeth. This is especially important for children with special healthcare needs, many of whom are at risk for failure to thrive and nutritional deficiencies, and are more susceptible to dental decay.

Special dental considerations and care are required for children with chronic diseases and disorders. A wide spectrum of chronic conditions afflicts children, which can affect their intellectual capacity, behavior and physical abilities, and may compromise their ability to seek dental care. There are many common issues and helpful strategies that ensure the potential for normal oral growth and development, to prevent dental disease and maintain health. When implemented they can facilitate and complement their overall social and emotional health—and well-being.



**Behavioral Conditions**

Behavioral conditions such as autism, intellectual and developmental disabilities, and attention deficit and hyperactivity disorder (ADHD), lead to decreased willingness or ability to cooperate with activities of daily living. Many children with special needs (and their parents or caregivers), may not understand the need for prevention, or how to perform effective oral hygiene. Indeed children with physical disabilities may not even be capable of performing effective oral hygiene without help. It is imperative that parents and caregivers search out instruction and training from dental professionals to learn how to physically optimize the oral hygiene of the child with special needs.

In addition some children with special needs may have severe gag reflexes including the inability to tolerate toothpaste, trouble expectorating (coughing or spitting out), or keeping their mouths open. These factors make it difficult for caregivers to brush their child's teeth.

**Developmental Tooth Defects**

Children with chronic health conditions are more likely to be born with developmental tooth defects. One example is enamel hypoplasia (“hypo” – under; “plasia – growth”), a condition in which there is an insufficient amount of enamel on the teeth. Enamel is one of the hardest substances produced in the animal world, and forms the outermost layer of the crowns of teeth. Children diagnosed with conditions such as Down, Treacher-Collins, or Turner syndromes (genetic birth defects), are at risk for developmental tooth defects, as are very low birth weight infants.

Some of these children, including those with swallowing difficulties or intellectual and developmental disabilities, may have feeding problems involving prolonged meals and food pouching (hoarding food in their cheeks).



**CHRONIC CONDITIONS**

A chronic health condition is defined here as: a health problem that lasts over 12 months; affects your child's normal activities; requires visits to a hospital and/or home health care, and/or extensive medical care.

Even though each illness is very different, families of children living with chronic conditions have a lot in common. Learning to manage a chronic condition can be very challenging for a child, for parents, and for siblings and friends. Based on this definition, about 15% to 18% of children in the United States live with a chronic health condition.

There are also connections between oral and systemic diseases that affect children with certain chronic health conditions. For instance, untreated tooth decay can compromise the overall health of children diagnosed with cancer, undergoing radiotherapy or chemotherapy. In addition, pain caused by untreated tooth decay is associated with school absences and poor academic performance — factors that have social consequences extending far beyond early childhood.

“Chronic condition” is an umbrella term. Children with chronic illnesses may be ill or well at any given time, but they are always living with their conditions. Some examples of chronic conditions include, but are not limited to, asthma, diabetes, cerebral palsy, sickle cell anemia, cystic fibrosis, cancer, AIDS, epilepsy, spina bifida, congenital heart problems.

**CHRONIC DISEASE AND TOOTH DECAY**

Tooth decay is a major cause of tooth loss in children. Acidogenic (acid-producing) bacteria make acids from sugars in the diet that cause tooth decay. These bacteria, which live in the biofilm that collects on the teeth, are commonly transmitted from mothers to their children through everyday activities such as sharing utensils, kissing or even licking the child's pacifier. Mothers with untreated tooth decay are more likely to infect their children. Others in poor oral health and in close contact with the child — siblings, relatives, caregivers, babysitters, and daycare workers — can infect the child as well.

The bacteria that cause decay thrive on a child's diet that is rich in carbohydrates. Examples are bread, rice, crackers, candies, sweets, honey, sodas, sports drinks, and fruit juices. Sweetened medications and nutritional beverages and shakes that many children with chronic health conditions take regularly are high in sugar content and are acidic as well.

Consuming these carbohydrate-laden foods more than a few times per day outside of mealtimes creates an environment that both attracts acid-producing bacteria and allows them to multiply more rapidly. More importantly, the constant acidity created overwhelms the ability of the saliva to buffer the acid and neutralize it, which normally takes about an hour. Thus hourly sugar-laden medicine or sugary snacking means the mouth is always acidic. This leads at first to tooth “demineralization,” the dissolution of the enamel on the tooth surface creating white spots. This early sign of decay is reversible; teeth can be “remineralized” with acid reduction and adequate exposure to fluorides.

Well-defined mealtimes with limited snacking, preferably on non-carbohydrate foods, plus not allowing children to snack and drink beverages all day, allows time for the saliva to help neutralize acid and return the mouth to normal. Unchecked, white spots will eventually progress to tooth decay.

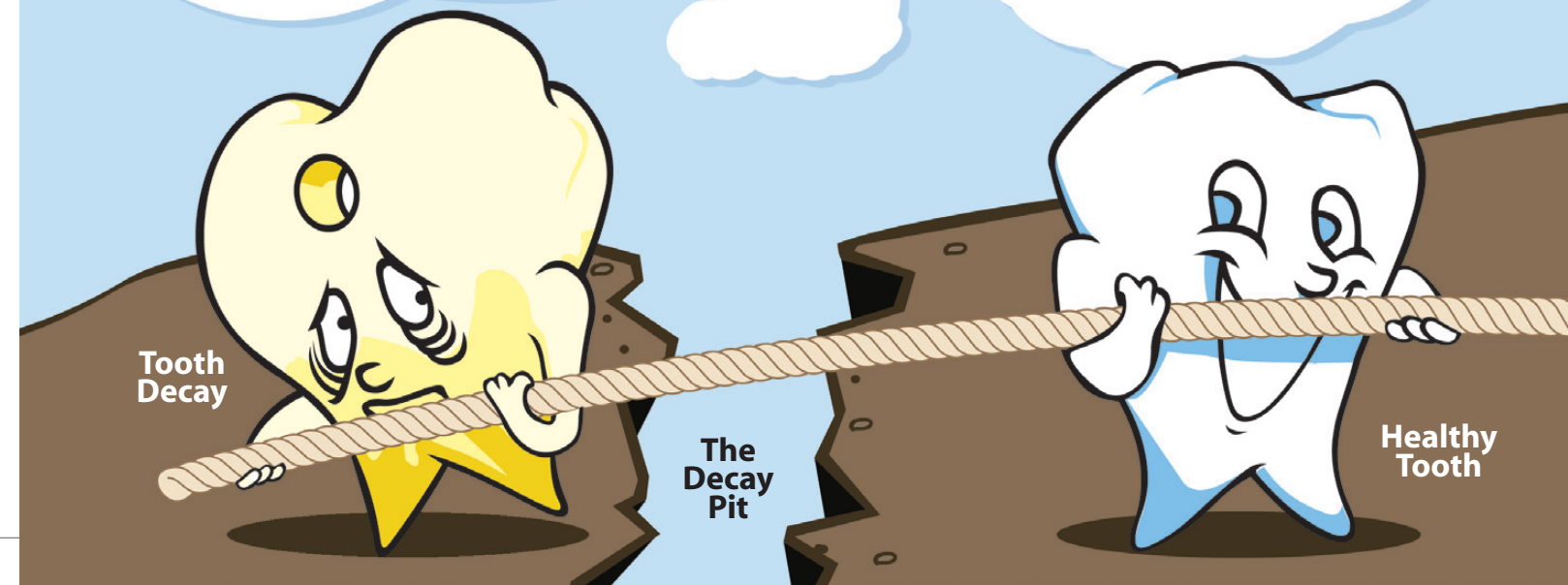
**WINNING THE BATTLE AGAINST TOOTH DECAY**

**Disease Causing Factors**

- B**ad Bacteria
- A**bsence of Saliva
- D**ietary Habits (Poor)

**Protective Factors**

- S**aliva and Sealants
- A**ntimicrobials
- F**luoride
- E**ffective Diet



## Correct amount of toothpaste for children

Children commonly use more toothpaste than the recommended amount on their toothbrush. Too much toothpaste increases the chances of your child consuming too much fluoride.

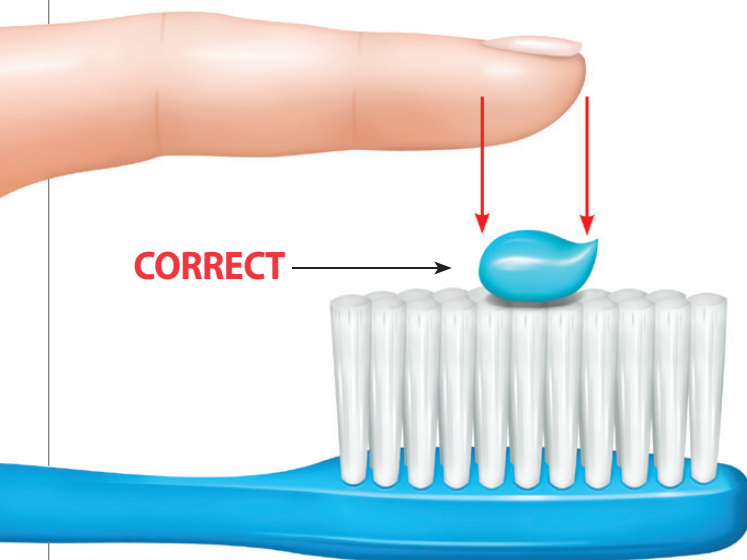


Figure 1: The above illustration shows the proper amount of toothpaste for a child, which is a pea-sized amount or roughly the size of their fingernail.

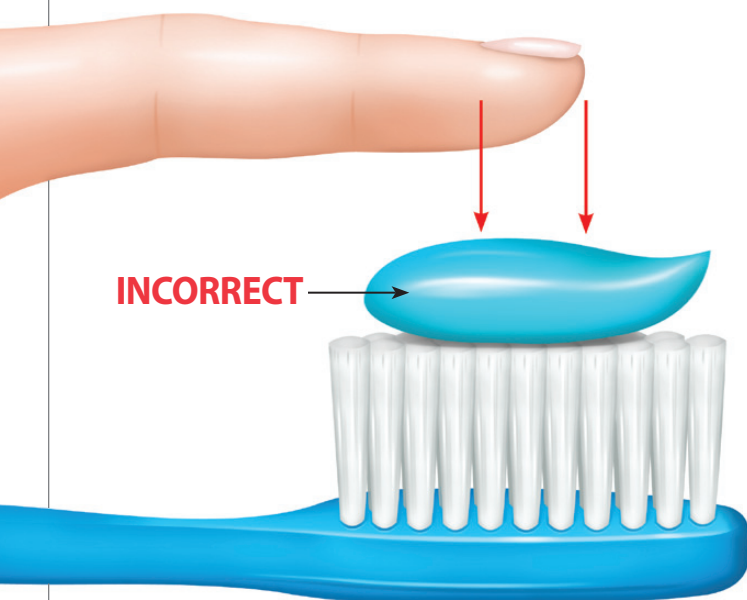


Figure 2: The above illustration shows the incorrect amount of toothpaste for a child. This amount could be swallowed by the child increasing or exceeding the daily amount necessary.

### SPECIAL CARE FOR SPECIAL NEEDS

All children should have a first dental visit by their first birthday. The Age One Dental Visit ensures that the child has a “dental home” in which preventive care is provided regularly and restorative care can be instituted when necessary. In cases where tooth decay is already present, dental restorative treatment techniques can be utilized to minimize discomfort and eliminate the need for local anesthetic. These techniques are quick and effective — particularly helpful in treating children with chronic health conditions.

### Fluoride

Fluoride is a naturally occurring element that strengthens tooth enamel during its development when it is incorporated into the enamel’s structure, making it more resistant to acid attack. Fluoride also increases resistance when applied topically to the surfaces of the teeth. The most cost-effective fluoride delivery system comes in the form of community water fluoridation. About two-thirds of the U.S. population lives in communities with fluoridated water supplies. The recommended amount of fluoride in water supplies is 0.7 parts per million — a very small amount that goes a long way.

Fluoride is the active ingredient in toothpaste. Brushing your child’s teeth with a fluoridated toothpaste is effective in preventing tooth decay. You should use just a smear for children under age 2 and a pea-sized amount for children age 2 and older. Any brand will do, especially if it carries the American Dental Association (ADA) seal of approval. Side effects only occur when children are allowed to habitually lick, eat or swallow flavored toothpaste. Brushing with fluoridated toothpaste twice per day is more effective than brushing once per day. Children can brush their teeth themselves when they get older but need to have adult supervision.

Fluoride varnish is commonly applied to children’s teeth in dental and medical clinics. Two to four fluoride varnish applications per year has become the standard of care.

While helpful, fluoride alone is unlikely to prevent tooth decay in children who are heavily infected with decay-causing bacteria and have a bad diet.

**New!**

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**Xylitol**

Xylitol is a naturally occurring sweetener that improves oral health. It looks and tastes like table sugar and can be purchased for use on cereal and other foods. There is strong research evidence showing the benefits of adding xylitol to the diet of preschoolers at risk for tooth decay. A recent study of children aged 15-30 months found that two tablespoons of xylitol syrup (xylitol, water, and flavoring) squirted on to the teeth two to three times per day reduced tooth decay by as much as 70%. Xylitol use also complements the effects of fluoride and has few side effects.

**Oral Hygiene Practices**

Depending on the degree of physical and mental abilities, healthy dental habits may be difficult to provide for your children.

“Modeling and shaping” behavior are useful techniques when training individuals in proper oral hygiene. For example, tooth-brushing for a child will help them learn the necessary motion to use and the feel of clean tooth surfaces. The feel of clean teeth provides self-evaluation and reinforces positive behavior and change. Try to establish a routine and healthy habits at a young age. Your child may also respond to brushing with a sibling for example. Children are powerful role models for other children, which may also be reinforcing.

If you have very limited cooperation, gentle positioning of a child “knee-to-knee” makes it easier to brush the child’s teeth. A second toothbrush can be used as a mouth prop to help keep the child from clenching or biting. For children who cannot swallow or rinse, cotton gauze can be used to dry the teeth after brushing. When it comes time to find a dentist, it is important to find a dentist who is trained to treat special needs children. Caregivers need to be comfortable, and dental offices that allow caregivers to remain by the child’s side during dental appointments may also be important to you and your child.



Whether you start out by brushing your children’s teeth or demonstrating and watching them successfully perform oral hygiene techniques, you are establishing proper hygiene practices that will last a lifetime.



Sometimes, the best motivation and stimulation for shaping oral hygiene behavior is the inspiration of an older sibling acting as a role model.



Weaning children from bottles and training cups as early as possible, and encouraging the use of open cups filled with milk or preferably with water is recommended.

**Dietary Practices**

Children requiring special diets (e.g., nutritional shakes or beverages, and frequent feedings to boost their calorie-intake) have an increased need for dental visits, especially when very young. Parents also need to be trained and vigilant regarding the signs of developing tooth decay.

To soothe children during naps or bedtime, many caregivers fill bottles or no-spill training cups with sugary beverages such as juice, or coat pacifiers with honey. This practice greatly exacerbates the risk for tooth decay. Juice diluted with water is as bad for the teeth as undiluted juice. Weaning children from bottles and training cups as early as possible, and encouraging the use of open cups filled with milk or preferably with water is recommended.

**Chronic Medication Use**

Children with chronic health conditions commonly require medications to treat their medical conditions, e.g., antidepressants, antihistamines, antitussives (for coughing), bronchodilators (to assist breathing), and mucolytics (to break up mucus). Many of these cause mouth dryness, greatly increasing risk for tooth decay. Many of these medications also contain sugar and are acidic, factors that contribute to tooth decay. In consultation with the child’s physician, medications should therefore be given to the child during mealtimes whenever possible.

**CONSEQUENCES ARE NOT INEVITABLE**

The consequences of untreated tooth decay include sensitivity while eating, pain and gum abscesses, all of which lead to poor oral and general health, impacting quality of life. Children with tooth decay also have: greater need for invasive dental treatments; fillings, baby-tooth root canals, crowns, and extractions; hospitalization; in rare cases, systemic (generalized) infections that can lead to death if left untreated. The health-related and social consequences of poor oral health for children with special needs highlight the importance of preventing dental caries (tooth decay) and managing the results of disease with the least invasive dental treatments possible. But these consequences are not inevitable. Dental care and healthy mouths are a critical part of overall health and well-being. Our children are our future, and all children are special.

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