

STRATEGIES FOR PROMOTING ORAL HEALTH IN CHILDREN: PREVENTIVE CARE, BEHAVIOR MANAGEMENT TECHNIQUES, AND INTERVENTIONS FOR EARLY CHILDHOOD CARIES

Manal Duraya Alanazi^{1*}, Ebtesam Husain Alharthi², AlBandari Ayedh AlMutairi³, Mai Saad Alsubaie⁴, Aisha Yahya Al Shajri⁵ and Safiah Abdulmohsen Ali Jawsh⁶

^{1*} Corresponding Author, Dental Assistant, manal-d12@hotmail.com, King Abdullah University hospital

² Dental Assistant, ehalharthi@outlook.sa, King Abdullah University hospital

³ Dental Assistant, aaalmotairi@pnu.edu.sa, King Abdullah University hospital

⁴ Dental Assistant, Mayortho7@gmail.com, King Abdullah University hospital

⁵ Dental Assistant, a3yoosh1@icloud.com, King Abdullah University hospital

⁶ Dental Assistant, safyah1919@gmail.com, King Abdullah University hospital

Abstract

It is widely recognized that early intervention in children's oral health is an important aspect of lifelong health promotion. A significant part of optimizing oral health for children and families is to provide preventive care and behavior management techniques to young children and to assess the need for intervention in cases where disease has already developed. This historic essay discusses the importance of such an approach to the prevention and negation of the millions of individuals who may already, like 13-year-old Marie, be on the verge of losing all their teeth to early childhood caries. (Krol et al., 2023)

It will take a system-wide approach with dental, medical, and allied health professionals collaborating in many roles. To address early childhood caries, it is crucial that pediatricians and other health professionals recognize oral disease as the chronic infectious disease it is, are aware of the need for oral healthcare referral, have knowledge of basic oral health promotion, can use motivational and behavioral management techniques, and are involved with families, schools, and communities to advocate for oral disease prevention. To gain knowledge of such multi-faceted dental interprofessional roles, we must invest in systems change that encourage the sharing of professional expertise and a range of oral health care among the multiple disciplines involved in oral health care. Cultural and technological updates are also necessary in 21st-century practices, given today's economy and dental resource challenges. (Ferrazzano et al.2020)

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1. Introduction to Oral Health in Children

Improving oral health in children is a public health priority in both developed and developing countries. Since one of the etiologic factors of oral diseases is the nature and pattern of oral and dental care, management should start at primary dentition. Deciduous teeth hold the places of permanent ones and affect dental development during childhood and adolescence, as well as oral skeletal growth. In addition, deciduous teeth and their infections and inflammations influence children's systemic health and nourishment. Decayed teeth and their sequela negatively affect the physical as well as emotional aspects of growth in children, modifying their social behavior as well. Because dental plaque and cariogenic pathogens triggered by both frequent snacking on cariogenic food and social habits cause cariogenic dental caries, the most prevalent and problematic lip and dental diseases of young children, the need for prevention and management in their general clinical practice is essential. (Crall & Vujicic, 2020)

From birth to the age of 18 years, a person goes through several developmental stages. Early childhood is the stage of life from infancy to 5 years old, which is the average age of entrance into kindergarten. In this age group, child growth reaches its peak, and the child's personality and potential are established. Major disorders or minor aberrations occurring during growth not only affect the present but also impact children's future health because of the role of primary dentition in the development of occlusion and in bone and soft tissue support for the permanent teeth. Primary teeth are almost all erupted by the age of 3 and a half years and remain in the mouth, in the absence of oro-dental traumas or unallocated extraction, up to the age of 6–7 years when the first permanent teeth erupt. Intervening to prevent or limit the repercussions of poor oral and dental health, as well as the related pain and/or aesthetic problems, is thus fundamental in both childhood and the pre-adolescence stage. (Health Organization, 2020)

2. The Importance of Oral Health in Childhood

In a report, it was stated that good oral health is integral to general health and well-being, positively affecting physical, mental, and social health. Healthy teeth are critical for adequate nutrition, healthy speech development, social acceptance, and overall well-being. However, millions of children in the United States suffer from poor oral health, which has far-reaching effects on overall health. The most widely reported childhood dental health problem is tooth decay, which, if left untreated, frequently leads to pain and infection. Dental caries is the most common chronic childhood disease. Dental caries can result in loss of teeth, an inability to chew food, and undernutrition. Child caregivers and parents have reported that children with dental problems have trouble eating, sleeping, learning, socializing, and participating in normal childhood activities. The psychosocial impacts of untreated oral health issues can include embarrassment, low self-esteem, self-consciousness, and social withdrawal. (Sabharwal et al., 2021)

Ironically, many of the children with the greatest need for dental care may not receive it because of the expense. Tooth decay is largely preventable, yet typically goes untreated and progresses because many youth lack effective preventive measures. Public expenditures for pediatric dental

care may exceed a significant amount per year. One-fifth of Medicaid-enrolled children have never received preventive dental care. Although one study showed that nonusers of dental services were more likely to have untreated decay over a study period, the reentry of children back into the dental care setting following a period of non-dental use may mean that many children who have similar levels of oral health risk factors may also have untreated decay. Early prevention measures for children are an effective strategy, saving money in the long run and decreasing the overall prevalence of poor oral health. Early prevention in the form of dietary counseling, fluoride applications, and oral hygiene education will decrease the loss of time from school and work as children receive treatment and their parents are unavailable for their own work. In all, economic hardships are significantly associated with worse dental problems because poor families do not have the resources. In the long run, the public expense is high. For this reason, a comprehensive approach to dentistry is required. Children who do not experience negative dental outcomes can participate in society more broadly. Children for whom dental problems have not been addressed are at increased risk for long-term health and community issues. It is because this report is focused on early childhood that it continues with the examination of young children. (Edelstein et al.2020)

3. Preventive Care Strategies for Children's Oral Health

Preventive care is the cornerstone of good oral health in children. This module presents a number of preventive care strategies that fit children over the course of their formative years. The content is organized by different areas of emphasis, but it is important to recognize that many of these strategies are interconnected and complementary approaches. Routine check-ups for young children at the dental clinic are essential for monitoring the development and status of teeth and jaws. Professionals can detect early signs of dental decay and implement a care plan to prevent the full onset of dental caries. Children will develop good oral care habits and continue to utilize dental services throughout their lifetime if they receive routine oral evaluations and education. Dietary suggestions and oral hygiene education can be part of an ongoing preventive oral health plan. (Adeghe2024)

Fluoride supplementation is an easy way to aid in the remineralization of teeth and to help prevent caries. Fluoride can help replace the minerals in the tooth enamel that have been eroded as a result of acid exposure from bacteria in plaque. Consuming an adequate level of fluoride in water and using a fluoride toothpaste can also help. Dental sealants are a protective layer applied to the chewing surfaces of molars to protect teeth from decay. They work by sealing out food, plaque, and acid by-products from teeth. Sealants are especially useful for preventing decay in children who are particularly cavity-prone, and they should be applied soon after the parent reports the presence of molars that may have decay. A preventive approach can greatly reduce caries and dental visits for the child and help the parent avoid lost work hours as a result of taking the child to the dentist. Preventive care should be part of wellness care at the child's regular medical check-up. Over time, the result will be reduced childhood dental caries. (Veneri et al.2024)

3.1. Regular Dental Check-ups

Regular dental check-ups are important for maintaining good oral health. Children should have a dental check-up every six months or according to the timing recommended by the dental professional so that any change in the mouth will be noticed, and appropriate intervention can be made. Infants and preschoolers should have a dental examination within six months of their first tooth erupting or by age eighteen months at the latest. Primary school children and those who have been referred to or treated by dental services should have a yearly dental examination.

The introduction of a new set of oral health initiative services, those that are being implemented to screen the developmental outcome of children from birth, will be integrated with the dental examination process. By not delaying or avoiding a child's first dental visit and with the preventive dental care services that are initiated for them, it is believed that the negative impact from children's exposure and others for their oral health and dentistry will be reduced. Parents and children who have a dental visit may be guided and educated towards good oral hygiene, eating practices, and fluoride use benefits. Successful check-ups result in motivation and a decrease in anxiety for future dental access.

Therefore, counseling the patient or the patient's caregiver can minimize caries burden and reduce disease progression. Learning about a patient's caries prevalence or history at the time of the check-up will provide background to ascertain the appropriate therapies. Dentists will use the evaluation findings from subsequent appointments to evaluate the progress and the dentistry that is provided. Therefore, it is important that the parents, who are responsible for the child, are informed at the time of their child's first dental appointment of what is required to meet the recommendation to have dental visits at least every six months.

3.2. Fluoride Supplementation

Dental caries, or the occurrence of cavities, is one of the most common chronic diseases reported in children and is caused by bacteria, primarily *Streptococcus mutans*. The condition erodes dental enamel, one of four major tissues in the body that does not regenerate like skin or mucous membranes. When inorganic chemical compounds rich in calcium and magnesium are consumed, they are then distributed through the bloodstream to remineralize the teeth. Fluoride supplementation, the provision of additional fluoride equivalent to 0.25–0.5 mg of fluoride per day, can make the tooth enamel more resistant to dissolution and enhance enamel strength. This preventive strategy usually occurs at the professional level, as professionally applied topical fluoride, such as a varnish, and from at-home fluoride toothpaste, mouthwash, and professionally applied rinses that may be prescribed.

Supplements to prevent and reduce the occurrence of dental caries for patients at high risk or with poor oral hygiene habits are not to replace optimal oral hygiene habits, as research indicates fluorides can reduce caries prevalence. Fluorides have been found to decrease the prevalence of dental caries on erupted and surface-level caries, while additional findings have reported survival

analysis to evaluate if tooth eruption determines caries development, severity, or surface-level affection. To reduce the risk of early childhood caries in children, it is essential to start oral health care at a young age. With proper care and routine checkups, dental caries is a preventable disease. Fluoride drops for infants are widely available, including by prescription, providing resources to educate and promote appropriate use to ensure age-appropriate levels of fluoride. Water fluoridation supplementation in drinking water and well water to the optimal level of fluoride has been reported as a less invasive health technique addressing public health concerns.

3.3. Dental Sealants

Molars are especially susceptible to the formation of caries, and children who have difficulties with oral hygiene are especially at risk. Dental sealants are a thin plastic coating placed on the surfaces of molars to prevent dental caries from developing. The sealant creates a smooth protective layer, reducing the areas on the tooth where plaque and food can attach. Most of the decay in children and adolescents occurs on the biting surface of their back teeth. This is because decay can form more easily in molars than in other teeth, due to the deeper grooves and pits found on their surface, making them difficult to remove through regular brushing. When used as part of a comprehensive prevention program, sealants have been shown to significantly reduce caries risk among susceptible children. Some researchers suggest that sealants can ease the burden of caries-related pain in vulnerable school-aged children. Application of sealants is quick and does not require the removal of tooth structure or the use of local anesthetic. Even when left in place for only 2 years, sealants have been shown to help prevent caries.

The caries prevention benefit of sealants can far offset the cost of applying them. One study reported that a single application of sealant on permanent molars when the teeth first appeared in the mouth as a child resulted in less caries over ten years than the expected caries that would have occurred without this intervention. Educating parents about the protective value of sealants continues to be appropriate. Promoting the use of dental sealants as part of a comprehensive approach to caries prevention can be an important part of pediatric practice. Pediatricians can involve themselves in this effort by promoting sealant usage in schools and with community health programs, and by considering its use in their private practices. The use of sealants may also reduce the risk of early caries in infants and toddlers by applying them to the teeth of preschool children. In order to respond to this risk, young children require early childhood caries interventions and preventive treatments, like sealants. There are few dentists treating very young children, and many children in the country's safety net healthcare system never visit a dentist until they are in their early school-age years. No substantial data are available on the utilization rate of dental sealants among infants and toddlers, and it is assumed to be low. It is important to attempt to increase the awareness of sealants as a preventive option for children, especially in dental healthcare facilities.

4. Behavior Management Techniques in Pediatric Dentistry

Behavior management is fundamental to a successful pediatric dental practice and involves supporting children to feel relaxed and cooperative during dental treatment. A range of behavior

management techniques is essential to dental practice with children, as there are many associated behavior management techniques to consider, given that dental treatment can instill anxiety and fear in children. Many children present for dental care with varying reactions. The initial visit may confirm an attitude developed during infancy and toddler years, or ignorance of the dental situation may warrant a curious attitude, or dental neglect may result in a very frightened and apprehensive youngster. While anxiety and fear are not the same, both reactions must be handled in a systematic approach designed to lead to patient cooperation. Behavior management is established in such a way as to gain patient confidence, build a close rapport with the children and their parents, build a supportive environment, and request compliance with instructions given. Different approaches may be necessary for individual children. (Dean, 2021)

Positive reinforcement, which generally provides desired behavior through either a reward or praise, is a behavior management technique that is particularly useful in pediatric dental practice. Reinforcement should be observed by the child as being rewarding. Praise is usually more rewarding for the child than a tangible reward. Praise should be wholehearted and, preferably, given immediately after the behavior. Tangible rewards range from stickers and tokens, which are provided at the completion of each visit, to end-of-treatment parties, gifts, or food rewards such as lollies and brushing charts. Actual presentation of a token should be accompanied by praise and recognition of cooperation. The tell-show-do technique is another effective behavior management technique. Before the procedure is initiated, the dentist should tell the patient what is going to happen, show what is going to happen by describing it, demonstrating on his or her finger or mirror, and then do the procedure. Describing the sensation that will be felt is neither ethical nor desirable. Above all, avoid stating that the patient will not feel a thing unless you are sure that topical anesthesia works. Distraction behavior management techniques help take the child's mind off the more distressing aspects of dental treatment. They include proper use of voice tone, show and tell, use of magic tricks, books, ceiling tiles, and toys. The technique used is determined by the child's age, fears, temperament, behavior performed, and the practitioner's interest and time permitted. (Nazzal et al.2021)

This method involves discussing with the child and parent that nitrous oxide sedation and the administration of local anesthesia are to be undertaken. The preparatory visit also includes the use of tell-show-do as well as the initiation of a music interest. The second part of the behavioral guidance utilized and demonstrated most notably in this case study is the voice modulation technique, thereby directing the child's feelings towards experience and reality. To use voice modulation, the children listen to the dentist talking excitedly and positively. It requires talking slowly and softly as if discussing a secret or whispering. Topics of conversation with younger children may involve pets, nursery, food, etc. With older children, voice modulation can focus on other interests. During dental procedures, dentists search for topics to chat with their patients, including favorite school teachers, favorite school subjects, and what did the patient dream of last night. Each dentist may find different topics. (Cunningham et al.2021)

4.1. Positive Reinforcement

Dental professionals have been using positive reinforcement strategies in behavior guidance aimed at children's visits for many years. With this technique, the dental professional “catches the child being good” and provides immediate rewards. The child learns that by behaving in a certain way, either by sitting quietly in the dental chair during dental treatment or by showing the dental professionals how well they brush their teeth, they will earn a small reward. Over time, attitudes toward dental visits are formed early on in children's lives. It is important to create a positive association with dental visits early in a child's life to encourage optimal oral health through adulthood.

The most effective positive reinforcement techniques for modifying behavior are immediate, specific, and tangible. Immediate rewards relate to timing and make the dental visit a pleasant experience. Rewards should be given at the time of the favorable behavior to create a direct association between the good behavior and the reward. Specific rewards relate to the behavior modification. The exact behavior that you hope to see increase needs to be identified, and the reward given should be based on that behavior. The behaviors minimized can be catchall, such as general cooperative behavior. Tangible rewards can be a variety of small trinkets such as stickers, small toys, extra prize points, or other small items. Rewards should be exciting to children. Little boys typically like action pictures such as laser swords, cars, and trucks, whereas little girls prefer glitter stickers or animal pictures. When presented with a reward, the dental professional should make a big deal and show the child that she is being rewarded. If the dental hygienist is excited about presenting the reward, the child will be excited also. The reward is the payoff that keeps the child interested. In addition to a treat, psychological rewards can also be employed, such as praise and positive reinforcement to boost a child's self-esteem. If the behavior of the child improves, the praise and reinforcement usually result in a smile or giggle. Normally, children are not expecting this praise, which is out of the ordinary for them. Variety in verbal praise also increases the effectiveness of this approach. For example, saying something like “great job not talking with your mouth full and continuing to lay back” provides very specific information so a child knows what behavior was so good. Offering a variety of verbal praise is important because if it is the same praise all the time, children tend to ignore this verbal feedback. Therefore, consistently varying the praise keeps the feedback valuable and the child's interest heightened. In addition, children should build trust with the staff members. Staff members repeatedly offering consistent reinforcement is very important to build that trust. Being consistent with the rewards also helps to strengthen that posture.

4.2. Tell-Show-Do Technique

As stated earlier, clear and supportive communication can alleviate dental fear and anxiety in children. One technique based on this premise that is commonly used in pediatric dentistry is the Tell-Show-Do approach. As the name implies, this technique consists of three components. It begins with the dentist telling the child in a language that he or she can understand what is to be

done in a friendly manner. Here, it is important to use personalized words and "child-friendly" terms instead of dental terms. The term "prankster" instead of "needle" or "toy airbrush" instead of "dental air turbine" are examples. After this instructive procedure, props are shown and introduced. Models, photographs, or even original instruments can be used as visuals. Lastly, the dentist starts the planned procedure following the Tell-Show-Do paradigm, communicating and engaging in friendly conversation with the patient.

The dentist adapts the approach to each individual child based on his or her level of understanding and cooperation. Most children find the method reassuring and cooperate well. If the caring and communication are appropriate, the hesitation and fear might be reduced significantly. However, negative reactions, fear, or crying are still possible, though this is mainly the case in children with dental fear or a low degree of cooperation. A positive response was observed after using the Tell-Show-Do paradigm in a seven-year-old girl with autism and severe dental fear during two invasive dental treatments. The child accepted the use of dental anesthesia, counter-pulsation anesthesia, and deroofting of painful ulcers without any premedication. The lack of previous dental trauma and her intellectual abilities might have influenced the success. It is interesting to note that, in this case, written and visual storytelling was successfully combined with Tell-Show-Do. This approach included letting the patient feel the needle stick irrelevant objects and the following anesthesia. A variation of this technique as "I tell-show you-tell me" technique was suggested.

4.3. Distraction Techniques

In dentistry, the entry point for successful behavior management may be as simple as distracting one's attention from the things in the office that one might find anxiety-provoking. This technique gets a child to redirect his attention away from anxiety-provoking stimuli. By making the child think of something more pleasant to him, the procedures will seem less intimidating and less frightening. There are many items that might be used as distractions in a pediatric dental practice. Toys, either in the instrument or in the shape of a treat during an exam, are often going to be the strategy of choice. Other toys with optical illusions work as a great visual aid. Introducing music to a treatment room can also be an effective way to calm the fears that a child might be feeling. It is always best to choose the music that caters to the child's own individual tastes.



Figure 2: Use of AV eyeglasses ‘VR Box’ and wireless headphones for distraction

Distraction methods have been found to decrease fear and/or crying during treatments, reduce anxiety in young patients, and reduce the stress reported in parents. Distraction techniques may prompt children's compliance with an appointment. For example, distraction's effectiveness is exemplified when the parent visits to observe a cleaning and fluoride appointment, which used no more than a toy that buzzes when polishing, thus distracting the child. The mother expresses her appreciation for the way the hygienist worked with her child who "didn't even know he was getting something on his teeth!" In this section, toys, a popular distraction method, are improved upon and researched as a device that improved attitude and willingness to comply with a dental procedure. In this section, information is also shared on the effectiveness of music and counseling to divert children's attention and improve calming, demonstrating that not all methods are non-invasive, but all can help tell stories to young patients.

5. Early Childhood Caries: Causes and Risk Factors

Early childhood caries (ECC) is most commonly associated with poor oral hygiene practices, including frequent consumption of cariogenic substances, such as from a baby bottle. The soft, immature enamel of primary teeth is easily attacked by acidogenic, aciduric mutans streptococci, especially *S. mutans*. The carious process in ECC is typically very rapid, and a large number of teeth may be involved at an early stage. Caries in young children is both preventable and treatable with early intervention. Despite the availability of effective and safe preventive measures, ECC remains a prevalent problem affecting children worldwide. Major causes and contributing factors to caries include frequent consumption of liquid carbohydrates during the night or throughout the day, particularly when a child is allowed to sleep in the absence of meticulous oral hygiene; future

lack of dental services; high levels of mutans streptococci in the primary caregiver or significant other; belonging to a socio-economic class with low income; enamel hypoplasia; the presence of visible plaque on teeth; no regular source of dental care; and having had teeth extracted as a child. (Suprabha et al.2021)

Fillings or extractions in preschool children are known in some instances to have occurred without the use of sedation, anesthesia, or antibiotics, resulting in serious dental infection. Any dental caries not properly and timely treated will begin the domino effect, where untreated infection and dental pain contribute to loss of sleep, impaired growth, childhood malnutrition, infection leading to serious facial cellulitis, inability to close the mouth, speech difficulties, lack of breath through the nostrils, and narrowing of cognitive processing. A two-year retrospective analysis involving 1,217 eligible children aged 1.6–31 months found that ECC prevalence had significantly increased. ECC has particularly been found to occur in larger percentages in lower enrollment socio-economic groups where only a few subjects generally apply for government welfare programs. At greatest risk are children from racially or ethnically disadvantaged backgrounds, especially if they have a decreased socio-economic status.

6. Interventions for Early Childhood Caries

Many interventions have been shown to be effective at reducing early childhood caries (ECC) incidence, morbidity, or both. These interventions are evidence-based, and only a few strategies have been proven to work in preventing ECC in children. These interventions comprise treatments focused on taking care of healthy teeth and are usually provided by a dentist. Research estimates that 50% to 90% of children aged 2 years and older visit the dentist annually, with treatment in the primary care setting focusing exclusively on prevention. One essential aim of ECC interventions is the prevention of new decay, especially among children who are already affected by ECC. (Schmoeckel et al., 2020)

Fluoride varnish is effective in preventing further decay in affected anterior teeth to ensure their stability and maintain function, and can be applied by a variety of healthcare providers. Healthy beverages and dietary counseling can be effective modes of prevention for when the baby does not have any cavities. Depending on the level of decay, pulpotomy and stainless steel crowns should be done on the primary teeth as early in the cavitation period as possible. While the care models protect teeth from further dental caries development, they also work to restore and support the remaining tooth pulp. A child's story shows an example of a child who could benefit from these care models as early as possible before their story becomes a reality. With parents' support and a team approach, we can change the trajectory of young children. Early interventions to manage ECC via dentists and primary care providers, dietary counseling, and fluoride application are an important hierarchy of interventions to lower the prevalence and severity of the disease.

6.1. Fluoride Varnish Application

Fluoride varnish is an in-office preventive intervention against ECC that provides protective benefits by increasing the strength of the enamel through its interaction with the minerals of the dental hard tissue. During applications, fluoride concentrations reaching the outer surface of the teeth treat the tooth surfaces, providing further mineralization. It is generally recommended that children receive fluoride varnish applications every three to six months, but these recommendations may increase to as often as once a month among populations at higher risk for developing ECC than the general population, such as Native American children and children living in American Indian reservations. Scientific evidence supports a decline in caries or cavities in at-risk children between 12 and 36 months of age living in urban areas who receive fluoride varnish treatment applications as part of their pediatric health care, although they have been shown to cause an acute increase in fluoride levels among children's teeth.

In comparison to the clearly observable changes in cavity rates after fluoride varnish applications, some studies examining the efficacy of fluoride varnish applications reported decreased disease rates that were not statistically significant. Reports of fluoride treatment attenuating tooth decay rates by 12 to 27% are often thought to be due to the water fluoridation effects in the water systems that children are exposed to outside of the studies. It is a popularly held belief that high concentrations of fluoride can be harmful to humans, although certain staff and patients have experienced beneficial outcomes during the application of fluoride varnish to children as young as six months of age. However, published recent reviews of the toxicity of fluoride have revealed that exposure to concentrations of fluoride during either water bottle decay therapy of 5,000 parts per million (ppm), under hospital settings of 12,000 ppm, or in office settings of 22,000 ppm - 23,000 ppm have not resulted in any significant adverse results or benefits to either healthy children or children receiving clinical ambulatory care for general surgical and pediatric patients. The FDA typically establishes limits on the maximum level of fluoride within fluoride varnish formulations and has guidelines that make professional application required for all fluoride treatments. The regular schedule for preventive dental health care among children offers opportunities for fluoride varnish applications at a number of settings, whereas a recommendation to repeatedly apply fluoride varnish indicates the dentist's high regard for the protective values of the application. Over the years, fluoride varnish therapy has moved away from being perceived as a multilateral treatment and is seen as the single best evidence-based practice.

6.2. Dietary Counseling

6.2. Dietary Counseling (Topical Fluoride)

Dietary counseling is an important part of ECC prevention because nutrition and oral health are directly related. In terms of nutrition, there are good choices, better choices, and best choices. Children and caregivers should be encouraged to make better and best choices for oral health. Some key nutritional recommendations for families include the following: reducing the amount of sugar in food and beverages, choosing foods with less added sugar, eating snacks that are healthy

for your child's teeth, and choosing only water between meals. Reducing the amount of sugar in food and drinks is important for childhood dental decay prevention because frequent and prolonged exposure to fermentable carbohydrates increases caries risk. The timing of eating habits – including how many times a day and for how many minutes – influences the prevalence of ECC more than the food and drink choices made by families. However, healthy dietary choices build an overall healthier immune response, and these good habits are more likely to be chosen by families who have received adequate ECC and nutritional counseling.

Counseling families about decreasing fermentable carbohydrate intake between meals helps to decrease caries risk. Culturally healthy snack ideas for families include: fruit, yogurt, cheese, crackers, veggie cups or hummus, sugar-free applesauce, whole grain pretzels, peanut butter, sugar-free pudding cups, popcorn, granola bars, sugar-free fruit cups in juice, sunflower seeds, and dried fruit. However, it is important that families are also given additional education about the risks presented by consuming dried fruit and raisins as well as sunflower seeds and popcorn for young children. Community programs and charitable organizations can purchase these snacks or obtain donations if the items are not already available at the clinic.

6.3. Pulpotomy and Stainless Steel Crowns

Stainless steel crowns are often associated with the treatment of ECC. Historically, these were utilized as part of completing the Hall technique; however, over the years, they have been utilized as an acceptable option for definitive restoration of primary molars. The primary functional consideration for a stainless steel crown is its use as a full-coverage restoration, replacing nearly 28% of original tooth structure destroyed by ECC. The benefits of stainless steel crowns include increased longevity, often outlasting a child's primary dentition. Clinical research studies have shown little loss of primary molars restored with stainless steel crowns compared to teeth treated with multiple restorations. As such, the evidence supports the role that restorations play in breaking the bad dental disease cycle, thereby preventing the development of dental infection, pain, and ultimately, dental extractions. Clinically, the hallmark for both pulpotomy and crown placement is the presence of caries that are moderate or severe. One study identified over a decade ago showed that the proportion of patients who ultimately required dental extraction was significantly greater in the group of children with both moderate and severe caries versus those with no, mild, or questionable caries. Pulpotomies and stainless steel crowns continue to play an important role in the prevention of ECC and are performed as needed following IA for SECC. Since SECCs are treated in children with severe caries or those with underlying cellulitis, pulpotomy and stainless steel crown placement may become part of their comprehensive treatment plan. Historically, recent studies have shown that the rate of dental extraction among these patients is approximately 52% if precipitating factors, such as dental disease and access to care, are not remediated quickly.

7. The Role of Parents and Caregivers in Promoting Children's Oral Health

Parents and caregivers play a crucial role in shaping children's oral hygiene practices. Education and advice regarding childhood oral health should be provided to caregivers, and the relevance

and importance of a comprehensive, timely dental plan should be emphasized for young children. In turn, caregivers are encouraged to model good dental health habits and assist in the practice of these to youngsters from an early age. They should also be informed of how to communicate dental health care advice effectively to children and to address any questions or concerns the children may have. Developing a supportive, open relationship with the dental health care professionals involved in managing a young patient is fundamental and supports the development of trust between these individuals and their young patients. This is also essential if the caregiver is to have access to helpful clinical advice on strategies to manage or decrease the risk of developing caries. (Zhang et al., 2020)

Caregivers of young children may encounter some barriers in assisting with the development of good oral hygiene practices. A number of these barriers and possible solutions are listed. Caregivers should be encouraged to assist their children in becoming familiar with the dental setting and to present them regularly for a dental check-up to create a supportive, preventive oral health home environment. Parents and caregivers are advised about useful strategies to ensure that their child can benefit from the preventive care available to prevent caries. In the early years, caregivers should schedule appointments every 6 months, before caries develops, which may require some flexibility on the dental team's behalf. Managing a child in the dental environment is a coordinated effort between the dental health professional and the caregiver. Shared goals and trust can lead to a positive experience for the child and the family. It is important that the child does not suffer from dental phobia since this negative emotion may mature into the long-term avoidance of dental health care. Interventions can certainly be carried out at the dental health practice and in the home environment, so cooperation between parents, caregivers, and dental health professionals is crucial. The overall goal should be to provide a practical, achievable plan for the parents, caregivers, and the individual child. (Berti et al.2020)

8. Community-Based Programs for Oral Health Promotion

The use of community-based programs to promote oral health in children and families has the potential to yield significant benefits. These projects are able to provide education and information to bridge the gap between changes within the population and access to dental services. Preventive education and dental health clinics serve as preferred-point initiatives or population-based prevention programs that will reduce or eliminate the prevalence of oral diseases in children and families. Low-income groups at high risk of dental problems have been observed to be delayed in initiating treatment, providing dental treatment for children who would not have access to dental care, including school-based dental screenings and preventive care at local health services. The program also annually trains teachers about the supply and impact of dental sealants on children and their education and provides them with information for children and their parents. (Akeru et al.2022)

Several researchers have observed a positive change in the knowledge level of nutrition and oral health and found a decrease in the prevalence of child-related dental caries following the

implementation of the program. However, screen reviews found that measures of some strength, the patient size and eligible questions are inconsistent in evaluating the real effect of TLIs. In a systematic review conducted on this topic, researchers reported that only two school-based studies met their strict inclusion criteria. School oral health fairs do not eliminate sugar parties for the prevention of severe caries in early childhood. A school-based program to reduce dental caries in early childhood is a community project that attempts to approximate access to those who might otherwise not seek treatment at a dental clinic. (Hargreaves et al.2022)

9. Technological Innovations in Pediatric Dentistry

The field of pediatric dentistry is witnessing technological innovations. The aim of these technologies is to improve oral health care for children and facilitate adjunctive management strategies to guarantee a positive clinical experience along with positive healing for the child in pediatric dentistry. The various technological recommendations suggested are performing dental treatment without the use of local anesthesia by means of laser dentistry, advancements in teledentistry pathways, and utilization of 3D imaging, among other novel technologies. By adopting these minimally invasive approaches, the dentist can benefit since they can provide a pleasant treatment experience while reducing anxiety and perception of pain in the young child to some extent. (Alauddin et al., 2021)

Digital technologies can help train patients and children related to home oral care as well. The digital education tools will help prepare the child for the dental visit and make them feel comfortable while meeting the dentist. Similarly, oral hygiene and other health instructions can be provided to the caregiver to improve oral hygiene practices in children and thereby decrease the risk of future oral diseases. With recent advancements in technology and the introduction of several child-friendly tools and techniques, pediatric dentists can provide a comprehensive pathway to manage the behavior of pediatric dental patients. When using some of these techniques with our patients, we have seen successful clinical results. Although these are case reports, several similar success stories have been reported. (Health Organization, 2021)

10. Cultural Considerations in Oral Health Promotion

The Presidential Task Force on Behavioral Science and Public Health defines culture as a system that incorporates learned and shared patterns of behavior that can greatly influence health and sickness. In their initial compilation of the negative health beliefs and practices around the world that ultimately led to widespread disease outbreaks, the need for involvement at the community level with cultural and belief system consideration was recognized. This is particularly important in early childhood for preventive care, as parents often make dental appointments and are responsible for the child's oral health behaviors. In addition, in order to teach a child oral health practices, dental professionals must first work with caregivers to adopt a similar level of desired or necessary knowledge. Health promotion strategies in the context of strong cultural beliefs and practices should address methods to effectively engage families in learning. However, there has

been little academic research on what asthma and vision researchers consider cultural beliefs or knowledge of diseases and primary care use. (Chen et al.2020)

Oral health programs have made culturally relevant products available to communities, such as children's books to improve oral hygiene and minimize early childhood caries. No research currently exists on the use of these materials with families from different backgrounds, but other prevention programs encourage the use of cultural books. Based on another popular community health education strategy, ethnic materials may also be introduced to pediatric dental practices. No studies are available on the efficacy of culturally or asset-based materials in oral prevention training. The final chapter for policy will review the broad concepts of cultural beliefs about children's dental health and their influence on people's opinions about addressing potential training or behavior problems. It is recommended that future practices be designed to collect those who have some preprogrammable ethical beliefs and acculturate this group to the current national or professional opinion. Again, no age-specific instruments are available to document parent or nurse cultural beliefs about new products or public health structures that may impact oral care for infants and children. As the linguistically diverse group of immigrants also now lives in the United States, this issue must also be reconsidered in the future. (Hoang et al.2020)

11. Evaluating the Effectiveness of Oral Health Promotion Strategies

In order to maximize a program's impact and likelihood for sustainability, it is advisable to evaluate the oral health promotion strategies or set of interventions implemented. When evaluating program activities, both process and outcome evaluations are needed to fully assess the impact of the given program. Qualitative evaluations provide in-depth insights about how families receive and react to information about their child's oral health. Quantitative evaluations can help determine if a program or intervention improves the oral health of children. (Arora et al.2021)

Working with state and local partners to evaluate oral health strategies at both the community and individual family level ideally requires identification of agreed-upon key performance indicators. Many successful strategies and approaches have been implemented to promote oral health and increase children's access to dental care; one way of measuring this is through tracking changes in the prevalence of caries in two- to six-year-olds, as well as tracking children's use of dental visits. As an example, the percentage of second-grade children with experience of caries has decreased in communities that have implemented preventive strategies for young children, while there has been no change in the percentage of second-grade children with restored carious teeth in communities that have not implemented these interventions. Local collaborations and partners can identify data sources for evaluations and prioritize key performance indicators depending on their community conditions and target population. Innovative methods such as evaluating first dental visits for young children have also been used. However, there are challenges with identifying appropriate measures for success or change in community-based programs. For this reason, data collection is often needed at multiple levels. Informal feedback from families and major

stakeholders, such as dental practitioners, can also be used for program improvement. (Liu et al., 2022)

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