Pediatric Dentistry

5th Year

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Dental Problems of Children with Special Health Care Needs

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AUTISM SPECTRUM DISORDER

Autism spectrum disorder (ASD) includes three neurodevelopmental disorders: autism disorder, Asperger syndrome, and pervasive development disorder (PDD). The prevalence is estimated to be 6 per 1000 children. The rise in the rates of ASD has been attributed to increased awareness and better diagnostic tools. It occurs with greater frequency in boys than girls.

The exact cause of ASD is not completely known, although genetic factors and environmental factors may play a role. Although the majority of cases are idiopathic, a small percent has a known inheritance such as fragile X syndrome, tuberous sclerosis, Rett syndrome, and Angelman syndrome. Many children with ASD present with a typical developmental period followed by regression in the second year. There are three levels of impairment noted:

The first notable impairment is social, which, in some cases is extreme, with lack of eye contact and not responding to one's name.

The second is impairment in communication, which can result in the delay or complete lack of spoken language. Children with Asperger syndrome do not have a general delay in language or cognitive development; however, they often have communication difficulties, especially in sustain conversations.

The third area of impairment in ASD is repetitive behaviors. They may include staring, floppy hands, an odd interest in or preoccupation with specific objects.

There is great variability in presentation in children with ASD, and the diagnosis is made based upon the number of symptoms involved. Children with ASD have multiple medical and behavioral problems that may make dental treatment difficult. These children often have poor muscle tone, poor coordination, drooling, a hyperactive knee jerk, and strabismus; 30% eventually develop epilepsy. Children with ASD may have strict routines and prefer soft foods and sweetened foods. Because of poor tongue coordination, children with ASD tend to "pouch" food instead of swallowing. This habit, combined with the desire for sweetened foods, leads to increased susceptibility to caries. Because of their tendency to adhere to routines, children with ASD may require several dental visits to acclimate to the dental environment. The use of a Papoose Board or Pedi-Wrap and preappointment conscious sedation may be necessary and in some instances has a calming effect on the child.

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CEREBRAL PALSY

Cerebral palsy is one of the primary handicapping conditions of childhood. It is not a specific disease entity but rather a collection of disabling disorders caused by insult and permanent damage to the brain in the prenatal and perinatal periods, during which time the central nervous system is still maturing. This disability might involve muscle weakness, stiffness, or paralysis, poor balance or irregular gait, and uncoordinated or involuntary

movements. It has been well established that any factor contributing to decreased oxygenation of the developing brain can be responsible for brain damage. In addition, causal relationships have been established between cerebral palsy and complications of labor or delivery; infections of the brain, such as meningitis and encephalitis; toxemias of pregnancy; congenital defects of the brain; kernicterus; poisoning with certain drugs and heavy metals; and accidents resulting in trauma to the head. There is a high correlation between premature birth and cerebral palsy.

The clinical manifestations of Cerebral palsy depend on the extent and location of damage to the brain. The following are some common manifestations:

1. Intellectual disability.
2. Seizure disorders.
3. Sensory deficits or dysfunctions.
4. Speech disorders.
5. Joint contractures.

No intraoral anomalies are unique to persons with cerebral palsy. However, several conditions are more common or more severe than in the general population. These conditions are as follows:

1. Periodontal disease. Periodontal disease and poor oral hygiene occur with great frequency in persons with cerebral palsy. (Patients with cerebral palsy and those who take phenytoin to control seizure activity will generally have a degree of gingival hyperplasia).

2. Dental caries. Increase the incidence of dental caries because of the type of diet, which is usually soft, and contain high carbohydrates.

3. Malocclusions. The prevalence of malocclusions in patients with cerebral palsy is approximately twice that in the general population. Commonly observed conditions include noticeable protrusion of the maxillary anterior teeth, excessive overbite and overjet, open bites, and unilateral crossbites.

4. Bruxism. It is commonly observed in patients with cerebral palsy. Severe occlusal attrition of the primary and permanent dentition may be noted, with the resulting loss of vertical interarch dimension. TMJ disorders may be sequelae of this condition in adult patients.

5. Trauma. Persons with cerebral palsy are more susceptible to trauma, particularly to the maxillary anterior teeth.

The following suggestions are offered to the clinician as being of practical significance in treating a patient with cerebral palsy:

1. Consider treating a patient who uses a wheelchair in the wheelchair.
2. If a patient is to be transferred to the dental chair, ask about a preference for the mode of transfer. If the patient has no preference, the two-person lift is recommended.
3. Stabilize the patient's head throughout all phases of dental treatment.

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4. Keep the patient's back slightly elevated to minimize difficulties in swallowing. Do not force the limbs into unnatural positions.
5. For control of involuntary jaw movements, choose from a variety of mouth props.
6. To minimize startle reflex reactions, avoid presenting stimuli such as abrupt movements, noises, and lights without forewarning the patient.
7. Introduce intraoral stimuli slowly to avoid eliciting a gag reflex or to make it less severe.
8. Work efficiently and quickly and minimize patient time in the chair to decrease fatigue of the involved muscles.
9. Sedation or general anesthesia may be an option for more complex patients.

HEARING LOSS

Hearing loss (deafness) is a disability that is often overlooked because it is not obvious. If impairment is severe enough that dentist and child cannot communicate verbally, the dentist must use sight, taste, and touch to communicate and to allow the child to learn about dental experiences. Many times, mild hearing losses are not diagnosed, which leads to management problems because of the child's misunderstanding of instructions; children with more severe hearing losses already have psychological and social disturbances that make dental behavior management more complex. Parents may suspect profound hearing loss if their infant does not respond to ordinary sounds or voices. Early identification and correction of hearing loss are essential for the normal development of communication skills. No abnormal dental findings are associated with hearing loss. The following should be considered in the treatment of a hearing-impaired patient:

1. Prepare the patient and parent before the first visit.
2. Let the patient and parent determine, during the initial appointment, how the patient desires to communicate (i.e., interpreter, lip reading, sign language, note writing [for child who can read], or a combination of these).
3. Enhance visibility for communication. Watch the patient's expression. Make sure the patient understands what the dental equipment is, what is going to happen, and how it will feel.
4. Reassure the patient with physical contact; hold the patient's hand initially, or place a hand reassuringly on the patient's shoulder while the patient maintains visual contact.
5. Use the tell-show-feel-do approach. Use visual aids and allow the patient to see the instruments, and demonstrate how they work. Hearing-impaired children may be very sensitive to vibration.
6. Display confidence; use smiles and reassuring gestures to build up confidence and reduce anxiety. Allow extra time for all appointments.

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7. Avoid blocking the patient's visual field, especially with a rubber dam.
8. Adjust the hearing aid (if the patient has one) before the handpiece is in operation because a hearing aid amplifies all sounds.
9. Make sure the parent or patient understands explanations of diagnosis and treatment.

VISUAL IMPAIRMENT

The modalities of listening, touching, tasting, and smelling are extremely important in helping these children learn coping behavior. Hypoplastic teeth and trauma to the anterior teeth have been reported to occur with greater than average frequency in visually impaired children. Such children are also more likely to have gingival inflammation because of their inability to see and remove plaque. Other dental abnormalities occur with the same frequency as in the general population.

Before initiating dental treatment for a visually impaired child, the dentist should keep the following points in mind:

1. Rather than using the tell-show-feel-do approach, invite the patient to touch, taste, or smell, recognizing that these senses are acute. Avoid sight references.

2. Describe in detail the instruments and objects to be placed in the patient's mouth. Demonstrate a rubber cup on the patient's fingernail.

3. Because strong tastes may be rejected, use smaller quantities of dental materials with such characteristics.

4. Some patients may be photophobic. Ask parents about light sensitivity and allow these patients to wear sunglasses.

5. Explain the procedures of oral hygiene and then place the patient's hand over yours as you slowly but deliberately guide the toothbrush.

6. Maintain a relaxed atmosphere. Remember that your patient cannot see your smile.

The provision of dental care to a visually impaired child is facilitated by an in-depth understanding of the patient's background. A team approach by all health professionals involved in the care of the child is ideal. Disease prevention and continuity of care are of utmost importance.

Epilepsy

It is a brain disorder characterized by excessive neuronal discharge that can produce seizures.

Manifestations of Epilepsy

Confusion	Breathing difficulty
Loss of consciousness	Drooling
Out of body experience	Making sounds
Falling down	Shaking

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Inability to move
Incontinence
Fear/Panic
Depression and sadness
Electric Shock Feeling
Tongue biting
Heart racing
Staring
Sweating
Teeth clenching/grinding

Oral Manifestations of Epilepsy

Increased risk for dental caries
Increased risk for oral trauma
Medication-induced gingival hyperplasia, bleeding gums, and delayed healing.

Behavior Management of Epilepsy

Take history
Ensure medication has been taken as prescribed before treatment to reduce risk of seizure.
Schedule appointment during time of day when seizures are less likely to occur.
Children with severe, uncontrolled epilepsy may require general anesthesia for restorative and surgical needs.
Minimize seizure triggers. Reduce stress and anxiety.
Keep bright light out of child's eyes or allow child to wear dark glasses.
Position the patient in as upright a position as possible
Use low amounts of water and high volume suction to minimize aspiration.

Seizure Management during Treatment

Remove all dental instruments from the mouth.
Clear the area around the dental chair.
Monitor airway to reduce risk of aspiration.
Note time seizure begins: if seizure continues >3 min call EMS

RESPIRATORY DISEASES

ASTHMA (REACTIVE AIRWAY DISEASE)

Asthma is a common childhood disease, affecting 1 in 10 children. It is a chronic diffuse obstructive airway disease characterized by inflammation, increased mucus production, and bronchial constriction, caused by edema of the mucous membranes, increased mucous secretions, and spasm of smooth muscle.

Before initiating dental treatment, the dentist should know what are the frequency and severity of the attacks, what are the triggering agents, when the patient was hospitalized and/or in the emergency department, when the last attack occurred, what medications the patient takes, and what limitations on activity the patient may have. Patients taking

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systemic corticosteroids and those who were hospitalized or in the emergency department in the preceding year should be treated with caution because they are at higher risk of morbidity and mortality.

Patients who use bronchodilators should take a dose before their appointment, and they should bring their inhalers or nebulizers into the dental office in case trouble arises. Behavioral methods are used to reduce anxiety and the child may need to be positioned in an upright position for the dental procedure, and nitrous oxide–oxygen analgesia may be helpful. Hydroxyzine hydrochloride (Vistaril) and diazepam (Valium) have been successful in alleviating anxiety. Barbiturates and narcotics are not indicated because of their potential for histamine release, leading to a bronchospasm. Aspirin compounds and nonsteroidal anti-inflammatory agents are contraindicated because about 4% of patients experience wheezing after taking these drugs.

Oral findings of children with moderate to severe asthma include higher caries rates, decreased salivary rates, increased prevalence of oral mucosal changes characteristic of chronic mouth breathers, and increased levels of gingivitis. Increased incidence of orofacial abnormalities such as high palatal vault, more posterior crossbites, greater overjets, and increased facial height is also seen.

HEART DISEASE

Heart disease can be divided into two general types: congenital and acquired. Because individuals with heart disease may require special precautions during dental treatment, such as antibiotic coverage for prevention of infective endocarditis (IE), a dentist should closely evaluate the medical histories of all patients to ascertain their cardiovascular status.

The dentist should obtain a thorough medical and dental history, perform a physical examination, formulate a complete treatment plan, and discuss the treatment with the child's physician or cardiologist. Behavior management techniques are useful, and conscious sedation and nitrous oxide–oxygen analgesia have also been proven beneficial in reducing anxiety in such patients. Conscious sedation monitoring and cardiopulmonary resuscitation equipment should be readily available during the appointment. If general anesthesia is indicated, the dental procedures should be completed in a hospital setting, where adequate supportive care is available if needed.

Other considerations are especially important in treating patients who are susceptible to IE:

- Pulp therapy is not recommended for primary teeth with a poor prognosis because of the high incidence of associated chronic infection. Extraction of such teeth with appropriate fixed-space maintenance is preferred.
- Endodontic therapy in the permanent dentition can usually be accomplished successfully if the teeth to be treated are carefully selected and the endodontic therapy is adequately performed.

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• A dentist who feels uncomfortable in treating patients who are susceptible to IE has a responsibility to refer them to someone who will adequately care for them.

Conditions at risk of infective Endocarditis during dental care:

Prophylactic antibiotic is necessary for invasive dental treatment:

1. Dental procedures likely to induce gingival or mucosal bleeding, including professional cleaning.
2. Surgical operations.
3. Incisions and drainage of infected tissues and endodontic treatment.
4. Intraligmentary injections.
5. Distal shoe space maintainer.

Any dental patient who has a history of congenital heart disease or rheumatic heart disease or who has a prosthetic heart valve should be considered susceptible. The American Heart Association's antibiotic recommendations for the prevention of bacterial endocarditis are presented as followed:

Regimens for a Dental Procedure

		REGIMEN: SINGLE DOSE 30 TO 60 MINUTES BEFORE PROCEDURE	
SITUATION	**AGENT**	**ADULTS**	**CHILDREN**
Oral	Amoxicillin	2 g	50 mg/kg
Unable to take oral medication	Ampicillin OR Cefazolin or ceftriaxone	2 g IM or IV 1 g IM or IV	50 mg/kg IM or IV 50 mg/kg IM or IV
Allergic to penicillins or ampicillin—oral	Cephalexin *† OR Clindamycin OR Azithromycin or clarithromycin	2 g 600 mg 500 mg	50 mg/kg 20 mg/kg 15 mg/kg
Allergic to penicillin or ampicillin and unable to take oral medication	Cefazolin or ceftriaxone† OR Clindamycin	1g IM or IV 600 mg IM or IV	50 mg/kg IM or IV 20 mg/kg IM or IV

IM, intramuscular; IV, intravenous.
*Or other first- or second-generation oral cephalosporin in equivalent adult or pediatric dosage.
†Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema, or urticaria with penicillins or ampicillin.

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