

# Autism Spectrum Disorder Child in Pediatric Dentistry - An Overview

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**Abstract:** *Autism Spectrum Disorder (ASD) management in paediatric dentistry include addressing the specific requirements and problems of children with ASD. Pedodontists ought to focus on primary prevention, which involves early detection and teaching parents about oral hygiene and tooth monitoring. Regular dental checkups are critical for children with ASD, who may have complex and personalised needs. Behavioural management approaches can help to minimise anxiety and increase compliance during dental operations. Managing oral health in children with ASD involves a diverse strategy that includes early detection, education, behavioural management approaches, sensory adjustments, and the use of technology. Collaboration among dental practitioners, paediatricians, and other caregivers is critical to providing the best treatment for children with ASD.*

**Keywords:** Pediatric Dentistry, Autism Spectrum Disorder, Special Health Care Needs

## 1. Introduction

Individuals with special health care needs (SCHN) are those who have "Any physical, developmental, mental, sensory, behavioural, cognitive, or emotional impairment or limiting condition that necessitates medical management, health care intervention, and the use of specialised services or programmes." (AAPD) <sup>1</sup>

Paediatric dentistry by definition focuses in including children's dental health, particularly those with special health care needs. So it is our obligation and right for every child to have complete oral health.

Autism is regarded as a spectrum condition because these children manifest several disorders namely chronic social communication difficulties, repetitive and restricted behaviour patterns, hobbies, and interests, decreased intellectual growth, hyperactivity or passivity, a short attention span, a high pain threshold, tactile and auditory hypersensitivity, exaggerated reactions to light and smell, difficulty relating to others, unusual object attachments, poor or nonexistent speech, inappropriate toy play, difficulty adjusting to routine changes, inappropriate crying and laughing, and a lack of danger awareness.

## 2. Prevalence

Autism prevalence rates are estimated to be between 3.43 and 6.74 per 1, 000. The Centres for Disease Control and Prevention reported a prevalence of 5.7 per 1, 000 (National Health Interview Survey) and 5.5 per 1, 000 (National Survey of Children's Health), with a male: female ratio of 3.7: 1.0.

A study found that autistic spectrum disorders (ASD) are prevalent in South Asia, with rates ranging from 0.09% in India. This suggests that up to one in every 93 children in the area may be affected.

### Etiological factors

Autism spectrum disorder can be caused by multifactorial factors and few of these factors are:

Involvement of genes (FOXP1, EXT1, ASTN2, MACROD2, MeCP2, CHD8, and SLC25A12), Fragile X Syndrome and

Tuberous sclerosis complex (TSC), Intrauterine infections and maternal immune responses can alter gene expression pathways, increasing the risk of ASD in children, Foetal alcohol syndrome, Environmental exposures, such as mercury from dental amalgams or pesticides.

### Levels of Autism Spectrum Disorder

ASD level 1 – High Functioning Autism - requires support, difficulty initiating social interactions, inflexibility of behavior, difficulty switching activities, organising and planning problems.

ASD level 2 – Autism – requires substantial support, marked deficits with social interactions, inflexibility of behavior, difficulty in coping with change, repetitive behaviors.

ASD level 3 - Severe Autism - require very substantial support, severe deficits with social interactions and communication, inflexibility of behavior, extreme difficulty in coping with change, repetitive behaviors interfere with functioning.

### General manifestations in ASD

#### a) Impairment of social interaction and communication:

Difficulty in establishing relationships, Inability to read and understand social interactions and to respond appropriately, Tendency to play with toys and objects stereotypically, Failure to develop normal speech and to communicate by gestures, Delayed onset of babbling and unusual gestures and these gestures are less often integrated with words, Differences in facial expression, Imitation, lack of eye contact, body postures and mutual or shared focus of attention, Delay in lack of expressive language skills. Differences in the pitch, rate, rhythm and stressing of words in speech, Repetitive and idiosyncratic language, Echolalia – repeats words.

#### b) Impairments of social imagination (Stimulus over selection):

Individuals with autism sometimes struggle to pay attention to important signs and/or information in their surroundings and may attend to an unduly limited fraction, This is known as stimulus over selection.

There may also be difficulty disengaging from one stimulus and moving attention to the next, which may contribute to part of the reported rigidity and resistance to change. The

individual can also have a limited attention span.

### c) Behavioral abnormalities:

These children display indifference, Joins in an interacts only if an adult insists and assists, One sided interaction, No eye contact, Difficulty in coping up with changes in daily routine. Their communication is usually by using hand gestures, Doesn't play with other children, Talks incessantly only about one topic, Lacks creative pretend play unlike other children of their cognitive stage.

Bizarre behavior, Inappropriate laughing or giggling, Likes to spin objects, Can do certain things very well and quickly but not tasks involving social understanding

- Cognitive abnormalities are – Poor at symbolization and undersanding abstract ideas and grasping theoretical concepts and mostly these children present with low IQ
- Increased vulnerability to dental problems: Autistic children may exhibit unusual behaviors that make oral hygiene difficult, leading to higher susceptibility to dental issues like cavities.
- Children with ASD may have sensory sensitivities that make oral hygiene difficult, such as aversion to the taste or texture of toothpaste, or the tactile sensation of the toothbrush.
- Meltdowns: These are overwhelming sensory or emotional experiences that can be triggered by various factors, such as sensory overload, changes in routine, or unfamiliar environments. During a meltdown, a child may exhibit behaviors like shouting, crying, rocking, or self -injurious actions. They may not be able to communicate their needs or respond to reason during this time.
- The child becomes completely overwhelmed and temporarily loses control of their behavior. Meltdowns can last longer than tantrums and may persist until the child is able to regulate their emotions and calm down.

These meltdowns can present in various ways, including:

**Verbal Expressions:** Children with ASD may exhibit verbal outbursts such as shouting, screaming, or crying during a meltdown.

**Physical Reactions:** Meltdowns can involve physical reactions like kicking, lashing out, biting, or other forms of physical aggression.

**Withdrawal:** In some cases, children may internalize their feelings and withdraw, becoming quiet and non - responsive during a meltdown.

**Pre - Meltdown Signs:** Meltdowns can be preceded by pre - meltdown signs, known as "rumblings, " which may include verbal or physical behaviors signaling an imminent meltdown.

**Stimming:** Stimming behaviors, which are repetitive self -stimulatory actions, may also be observed before or during a meltdown.

**Sensory Overload:** Meltdowns in children with ASD are often triggered by sensory overload or undesirable sensory inputs, leading to a loss of control.

- **Tantrums:** These are typically deliberate and targeted behaviors used to get something they want or avoid something they don't want. Tantrums usually involve crying, screaming, or kicking, but the child typically maintains some control over their behavior.

### d) Oral manifestations in ASD

- **Halitosis:** Bad breath can be due to bacterial activity, lack of oral hygiene and oral habits and sensory sensitivities
- **Oral Lesions:** unusual oral habits like bruxism due to hyperactivity of the mandible, gingival picking, tongue thrusting and non - nutritive chewing on objects, dental trauma and poor oral hygiene will also contribute to oral lesions and other oral health issues.
- **Drooling:** Due to low muscle tone (which affects the ability to control saliva and keep it within the mouth), sensory processing difficulties includes sensitivity around lips and face, swallowing difficulties, poor awareness in mouth and decreased strength in lips, enlarged adenoids and tonsils or oral motor weakness.
- **Ankyloglossia:** Due to genetic factors, Development issues when the frenulum is either too short or tight.
- **Hyper gag reflex:** An exaggerated response to stimulation in the back of the throat, making oral care procedures like brushing difficult.
- **Gingivitis:** Inflammation of the gums, often caused by plaque buildup due to inadequate oral hygiene. (Due to irregular brushing habits, lack in manual dexterity, poor eye hand coordination, sensory processing difficulties, medication side effects, dietary habits and reduced salivary flow)
- **High susceptibility to caries:** Individuals with ASD may be more prone to cavities due to challenges with maintaining proper oral hygiene or dietary habits.
- **Poor oral hygiene:** Difficulty with brushing and flossing due to sensory sensitivities, motor skills limitations, or lack of understanding about oral care routines.
- **Xerostomia:** Dry mouth, which can be caused by medications, certain medical conditions, dehydration and also due to mouth breathing. Due to this there can be increased risk of dental caries, gingivitis and periodontal disease, bruxism, difficulty with oral hygiene maintenance and even discomfort and pain.
- **Dental erosion:** Wearing away of tooth enamel due to factors like acid reflux, bruxism, or certain medications anticholinergics and ADHD. Medications (to treat symptoms related to ASD can lead to xerostomia and can contribute to erosion) and tricyclic medications.
- **Traumatic injuries:** Accidental injuries to the mouth or teeth due to self - injurious behaviors or sensory processing difficulties.

### Habits:

- **Mouth Breathing:** Can negatively affect facial growth, cause malocclusion, crowded teeth over time. Mouth breathing can contribute to sleep disturbances. Long term mouthbreathing can impact respiratory health leading to complications related to breathing and lung function over time.
- **Non - nutritive chewing:** Chewing on objects not meant for food consumption, such as toys or clothes. (Due to hyperactivity of Mandible, sensory sensitivities, stress and anxiety and communication difficulties)
- **Bruxism:** This refers to teeth grinding or clenching, which can damage teeth and cause jaw pain.
- **Damaging oral habits:** This includes actions like tongue thrusting (pushing the tongue against the teeth), lip biting, and pica (eating non - food items). These habits can damage teeth and soft tissues.

**e) Management of an ASD child**

**Pre - Appointment:** Some strategies which can help in managing an autistic child before they come to the dental clinic are

**Pre - visit preparation:**

- Collaboration with parents: Working closely with parents or caregivers to understand the child's preferences, triggers, and effective strategies can facilitate a smoother dental experience. Parental involvement helps in reducing anxiety, establishing trust and cooperation.
- Social stories and visual aids: Utilize social stories or picture schedules to explain the dental visit step - by - step and familiarize the child with the environment and procedures. Showing children positive photographs or images of the dental team and setting to create a favorable impression before the visit.
- Virtual tours: Offer virtual tours of the dental office beforehand to reduce anxiety about the unfamiliar setting.
- Introduction to Staff: Introducing the child to the dental staff during a pre - visit familiarization session also through videocalls which can help build rapport and trust, making the child more comfortable during the actual visit.
- Role - Playing Activities: Engaging in role - playing activities at home using props like toothbrushes, mirrors, and model teeth can further familiarize the child with dental tools and procedures, making the visit less intimidating.
- Social Stories: Creating social stories through flashcards and animated videos that outline each step of the dental visit process can help the child understand what to expect and prepare them for the experience in a structured and visual way.

**During Appointment:****Creating a welcoming environment:**

- When communicating with children with Autism Spectrum Disorder (ASD), it is essential to use clear, simple language and incorporate strategies that cater to their preferences and needs.
- Euphemisms of the Child's Likings: Tailoring communication to include euphemisms related to the child's interests or preferences can enhance engagement and understanding. Using terms or phrases that resonate with the child's favorite topics or activities can make communication more relatable and enjoyable for them.
- Non - Verbal Communication: Non - verbal communication plays a significant role in interacting with ASD children. Utilizing gestures, facial expressions, and body language can complement verbal communication and help convey emotions and messages effectively. Non - verbal cues can enhance understanding and facilitate a deeper connection with the child.
- Sensory Modifications: Dimming lights, playing calming music, providing fidget toys, and offering noise - canceling headphones can help manage sensory overload and create a more comfortable environment for children with ASD during their dental visit.
- Positive Atmosphere: Maintaining a friendly and welcoming atmosphere with clear communication, gentle interactions, and a patient - centered approach can help build trust and reduce anxiety for the child, promoting a positive experience.
- Exploration of Dental Instruments: Allowing the child to explore dental instruments in a non - threatening manner can help reduce fear and anxiety associated with them.
- Choice and Control: Offering the child choices, such as selecting the flavor of toothpaste, the order of procedures, or other small decisions, can provide a sense of control and empowerment, enhancing their comfort and cooperation during the visit.
- Calming Music: Playing calming music can help create a soothing atmosphere and reduce anxiety for children with ASD during their dental visit.
- Fidget Toys: Providing fidget toys can offer a tactile sensory experience that helps children with ASD stay calm and focused, promoting relaxation during the dental appointment.
- Weighted Blankets or Vests: Providing weighted blankets or vests can offer deep pressure input, promoting a sense of calmness to the child.
- Noise - Canceling Headphones: Using noise - canceling headphones can help minimize auditory distractions and reduce sensitivity to loud noises, creating a more comfortable environment during the dental visit.
- Sunglasses or Eye Shields: Offering sunglasses or eye shields can help reduce sensitivity to bright lights, which can be overwhelming for some children with ASD.
- Dimming Lights: Dimming the lights in the dental office can help create a more soothing environment, especially for children who are sensitive to bright or fluorescent lighting.
- Visual Aids and Social Stories: In addition to verbal and non - verbal communication, visual aids and social stories remain valuable tools for enhancing communication with ASD children. Using pictures, diagrams, or written stories that align with the child's interests can provide a visual representation of information, making it easier for the child to comprehend and engage.
- Gradual Exposure: It is beneficial to have a gradual and slow exposure to the dental office environment to prevent fear and anxiety in children with ASD.
- Positive Reinforcement: Implementing positive reinforcement techniques, such as praise, rewards, or small breaks, can help motivate and encourage desired behaviors during dental procedures.
- Memory Restructuring: Helping children reframe negative memories associated with dental visits through positive experiences.
- Creating a Calm Environment: Establishing a calm and sensory - friendly environment in the dental office can help minimize stress and sensory overload for children with ASD. Dimming lights, playing soothing music, or providing sensory tools can contribute to a more relaxed atmosphere.
- Behavioral Guidance Techniques: Implement basic behavior guidance techniques like Tell - Show - Do, voice control, nonverbal communication, and positive reinforcement to help children navigate dental visits effectively.

Applied Behavior Analysis (ABA) is a science - based approach that utilizes systematic procedures to modify socially significant behaviors.

There are several types of ABA therapy:

- Discrete Trial Training (DTT): This involves breaking a skill down into small steps and teaching it step - by - step through a series of trials.
- Picture Exchange Communication System (PECS): This is a method that uses visual symbols to help children with ASD communicate their needs and wants.
- Modeling: This involves demonstrating a desired behavior for the child to learn and imitate.
- Shaping: Breaking down specific skills into manageable steps and rewarding the child as they learn each component skill. Shaping techniques can help children sit on the dental chair independently.
- Positive Reinforcement: Rewarding preferred behaviors to strengthen their recurrence. This can involve rewarding with toys, praise, or other positive reinforcers to enhance compliance during dental procedures.
- Visual Aids: Using visual aids like social stories, flashcards, and visual schedules to help ASD children understand the sequence of dental procedures and reduce anxiety.
- Desensitization: Employing desensitization techniques to diminish apprehension, especially for severe cases. This involves familiarizing the child with basic dental procedures in a step - wise approach.
- Voice Control: Using specific phrases or nonverbal cues to elicit appropriate behaviors from the child during dental procedures.
- Distractions: Providing distractions like watching cartoons, listening to music, or holding special toys to help children with ASD stay engaged during dental treatments.

Analysis is done through:

- Functional Behavioral Evaluation: Conducting a functional behavioral evaluation to understand the child's behavioral characteristics and responses, allowing for a personalized approach to behavior management.
- Systematic Behavior Analysis: Analyzing the antecedents and consequences of behavior to identify triggers and appropriate responses, ensuring that interventions are tailored to the child's cognitive abilities.
- Step - by - Step Teaching: Breaking down dental procedures into specific steps and teaching them separately, rewarding the child as they learn each component skill, which is known as shaping.

### Management of Oral Manifestations

Mouth breathing can be managed through: Breathing Techniques, Behavioral Interventions (Utilize Applied Behavior Analysis (ABA)), Medical Intervention (such as Wearing an oral appliance or addressing adenoid swelling, to support the normalization of breathing patterns and prevent long - term complications related to respiratory health)

Non - nutritive chewing can be managed through: Identify Sensory Needs, Support Self - Soothing Strategies (like breathing exercises or comforting items such as a soft blanket can help support children with ASD in managing their anxiety and reducing the urge to chew on non - food items),

Behavioral Interventions (biofeedback, relaxation techniques, and improved sleep hygiene), Provide Edible Alternatives

Bruxism can be managed through: Myofunctional therapy exercises and speech therapy, Behavioral Changes (biofeedback, relaxation techniques, and improved sleep hygiene), Pharmacological Interventions (benzodiazepines, anticonvulsants, beta - blockers, serotonergic and dopaminergic drugs, antidepressants, muscle relaxants, and botulinum toxin)

Halitosis can be managed through: Good oral hygiene, Regular dental check - ups, Addressing underlying causes (gum disease, tooth decay, mouth infections, or sinus issues).

Oral lesions can be managed through: Utilizing behavioral management techniques (to modify harmful oral habits like bruxism, tongue thrusting, lip biting, and gingival picking), Regular Dental Check - ups, Preventive dental care (like fluoride treatments, dental sealants, and oral hygiene education)

Droping can be managed through: Oral motor exercises, Increasing awareness, Developing eating skills related to saliva control (such as increasing lip closure duration and lateral tongue movements in chewing), Consult with professionals (such as speech pathologists, occupational therapists, paediatricians, or ear, nose, and throat specialists to address the underlying causes of drooling)

Ankyloglossia can be managed through: lasers for frenotomy, electrocautery, traditional surgical methods, speech therapies and exercises (can help with articulation and general speaking ability), myofunctional therapy (help improve tongue function and movement)

Hyper gag reflex can be managed through: Sensory Considerations (Providing sensory alternatives, such as teething toys with different textures, can help desensitize the child's gag reflex and improve tolerance to various food textures), Gradual Exposure to Textures, Oral Motor Skills Development (tooth brushing and playing face - touch games with stuffed toys can help improve oral sensitivity and reduce hypersensitivity in the mouth area, potentially decreasing the hyper gag reflex), Behavioral Support (Implement positive reinforcement techniques and desensitization methods to help children gradually overcome their hyper gag reflex)

High susceptibility to caries is managed through: Oral Health Preventive Programs (oral health, nutrition, correct brushing techniques, and the use of fissure sealants), Behavioral modification techniques (creating a sensory adapted environment (SAE), to help children relax during dental treatments), Provide dental education and training to teachers and children.

Gingivitis can be managed through: Home Care (Encourage children with ASD to carefully brush their teeth and gumline twice a day using a soft toothbrush, using waxed floss or an interdental brush can help remove plaque and manage gingivitis symptoms like bleeding gums, redness, and swelling), Professional Intervention, Prevention (regular brushing, using low - fluoride toothpaste for young children

and regular toothpaste for older children, and cleaning between teeth daily with floss or an interdental brush)

Traumatic injuries can be managed through: Creating a Safe Environment (Using grounding exercises, such as mindfulness techniques, can assist children in managing distress and anxiety after a traumatic event), Communication and Support (Using a calm and reassuring tone of voice when explaining traumatic events to autistic children is essential, Encouraging children to express their feelings through various means like drawing or using sensory tools can facilitate communication and emotional processing), Routine and Structure (Maintaining routines and structure in the child's day can help them feel more in control and secure after a traumatic event, Including calming activities in the daily schedule can assist children in managing their emotions effectively), Preparation and Education (Informing children about changes before they happen and using visual supports like social stories can help them understand and prepare for new situations)

Xerostomia can be managed through: Sensory techniques (decrease exposure to auditory and taste stimuli, gentle introduction to toothbrushing), Medication side effects, behavioral approaches (behavioral training, visual aids and social stories), dental environment adaptations (creating a comfortable environment)

### 3. Conclusion

ASD is a multifaceted disorder that impacts social relationships, cognitive abilities, sensory processing, communication, and behaviour. These issues make dental treatment more difficult in autistic children, favouring tooth decay, delayed tooth eruption, and severe periodontal disease. Children with ASD require specific treatment due to their unique communicative, sensory, and medical demands. Pedodontists can assist children with ASD maintain excellent oral health while reducing their anxiety and dread of dental treatment by employing behavioural management approaches, sensory - friendly treatments, alternate communication methods, and including parents in their child's dental care.

In paediatric dentistry, treating children with ASD requires a thorough and personalised approach. Dentist must be prepared to deal with dental anxiety as well as challenging behaviour in children with ASD during treatment. Strategies such as pre - visit talks with parents, recognising the child's medical problems, and taking into consideration any sensitivities to dental products are critical for providing good dental treatment.

Addressing the oral health of children with ASD in the dental setting requires a specialised and patient - centered approach. Understanding the particular problems experienced by children with ASD allows dental practitioners to deliver quality treatment, minimise anxiety, and promote collaboration during dental appointments, resulting in better oral health outcomes for this vulnerable group.

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