



Special Patient Series: Treating the Paediatric Patient

Reading 10 min.

Summary : Great oral health begins in childhood, but paediatric patients are a uniquely challenging group for dental professionals. This article aims to summarise the key oral health needs in paediatric patients, discuss best-practice guidelines for treatment, and present evidence-based strategies for overcoming the most common challenges.

Oral health in children

Dental caries remains the most common health condition afflicting children worldwide, with an estimated 514 million children suffering from caries of the primary teeth.[1] Children are also especially vulnerable to dental injury, with one third of all pre-school children worldwide reported to have sustained a traumatic dental injury (TDI) to the primary teeth, and a quarter of all school-aged children having sustained a TDI to the permanent teeth.[2]

Preventing and treating dental caries, TDIs, and other common childhood oral health concerns presents significant challenges for the dental professional. One such challenge is the wide variation in the physiological characteristics of this age group, giving rise to important clinical considerations.

Clinical considerations in paediatric patients

Choice of local anaesthetic

When choosing a local anaesthetic for paediatric patients, pharmacokinetics and duration of action are prime considerations.

A child's smaller body mass requires a lower dose to achieve an adequate but safe level of anaesthesia. Articaine is increasingly favoured in children aged four and older because it is rapidly metabolised, resulting in a short elimination half-life of about 20 minutes, thereby possessing a decreased potential for systemic toxicity.

Further, articaine diffuses through hard and soft tissues more reliably than other local anaesthetics. As a result, it may be possible to achieve palatal soft tissue anaesthesia using maxillary buccal infiltration rather than palatal injection, a painful and potentially traumatic method for young patients.

A long-acting anaesthetic, such as bupivacaine, can leave children vulnerable to self-inflicted soft tissue damage after treatment. It is therefore rarely indicated in the paediatric dental population.

Because the variation in body mass across this patient group is so wide, there is no one-size-fits-all approach to paediatric dosage. The maximum dosage should be calculated on a patient-to-patient basis according to the weight of the child, not to exceed 7 mg/kg for articaine. However, the clinician should always strive to use the lowest dose possible to achieve the treatment goal.

Use of epinephrine

Where possible, a local anaesthetic with a lower volume of epinephrine is preferable for paediatric patients. Higher epinephrine concentrations from partial intravascular injection can have a more pronounced effect on children, so careful aspiration is of the utmost importance.

In patients with contraindications like cardiovascular disease, an anaesthetic without epinephrine such as plain Mepivacaine is recommended for short procedures.

Administration method

Whenever possible, anaesthesia should be administered to children by intraligamentary injection (also known as periodontal ligament injection). The insertion pain is relatively low, it requires a lower dose of local anaesthetic as the anaesthesia is confined to a smaller area, and it resolves more quickly after treatment, making it an ideal method for paediatric patients.

Infiltration anaesthesia is suitable for many procedures in children. Up to the age of five or six, for example, it may be sufficient in the mandibular posterior region due to the less dense bone structure in younger children.

From the eruption of the permanent first molars, conduction anaesthesia of the inferior alveolar nerve at the mandibular foramen may be considered for surgical

procedures in the mandible. It may be possible using an epinephrine-free anaesthetic.

Palatal injection is especially painful for children. It has been demonstrated that the buccal infiltration of articaine (1/2 to 2/3 of a cartridge in children) can provide successful palatal soft tissue anaesthesia without the need for a palatal injection.

Analgesics and antibiotics

The management of post-operative pain must also be taken into consideration. Paracetamol (acetaminophen) is considered the gold-standard analgesic and antipyretic for mild to moderate pain in children. Due to the association with a condition called Reye's syndrome, medications containing aspirin should be advised against in children under 14.

Amoxicillin is typically the first-line antibiotic for post-operative infection control in children, but can be substituted with clindamycin in the case of a penicillin allergy. Tetracyclines should not be prescribed before the age of eight due to the risk of enamel discolouration.

Behavioural challenges in treating the paediatric patient

In addition to clinical considerations, there may be significant behavioural barriers relating to age, communication skills, cognitive ability, and attitudes towards dentistry.

While many children are able to manage their discomfort or apprehension, dental professionals often encounter children with a lower capacity for behavioural and emotional regulation. They may exhibit behaviours that make treatment stressful and potentially unsafe for both them and the patient, such as:

- Crying or screaming.
- Shaking or trembling.
- Flinching or cowering.
- Fidgeting.
- Complaining.
- Passively or actively resisting.
- Ignoring or failing to hear instructions.

- Attempting to hide or flee.
- Clinging to the caregiver.

These behaviours are most often seen in very young children and those with developmental or behavioural disorders. This patient group, termed “pre-cooperative” or “lacking cooperative ability”, possesses underdeveloped cognitive abilities, attention spans, and/or coping strategies necessary to navigate potentially uncomfortable situations like dental visits.

Paediatric patients of all ages can demonstrate maladaptive behaviours due to their attitudes towards dental treatment. Up to 33% of children and adolescents are believed to suffer from dental anxiety, and many more experience apprehension or aversion that can cause challenging behaviours.[3]

A young patient’s attitude and behaviour at the dentist can be influenced by a number of factors, including:

- **Previous experiences.** A previous painful or traumatic dental visit can inspire fearful behaviour at future visits. In fact, many adults with dental anxiety attribute it to such an experience during childhood.[4]
- **Parental attitudes.** The way a parent discusses dental treatment can shape the child’s view. This might include a parent giving a well-intentioned “pep talk” that hints at an unpleasant experience ahead, or expressing dread about their own dental appointments.
- **Vicarious experiences.** Children use the experiences of parents, siblings, peers, and even other patients in the waiting room to form expectations about treatment. They are also frequently exposed to negative portrayals of dentistry in popular media.

While the development of these factors is outside the control of the dentist, there are plenty of strategies for mitigating their impact. In the following sections, we will explore various behavioural management techniques, communication strategies, and clinical tools the dental professional can use in order to manage the needs of paediatric patients.

Behavioural management and communication strategies

Positive pre-visit imagery

Positive dental imagery can show children what to expect and combat any negative preconceptions they may have about the dental experience. Provide or direct parents towards resources, like YouTube channels, story books, or virtual tours of your practice, that they can share with their children ahead of a visit.

Desensitisation

Desensitisation is a well-established method for diminishing negative emotional reactions associated with dental anxiety in paediatric patients, particularly neurodivergent children.[5] It involves exposing the child to the source of their fear in a controlled and gradual way, allowing them to become comfortable before moving on to the next stage. To illustrate, a sequence of desensitisation at the dental office may go as follows:

- Reading story books about the dentist with a parent.
- Watching a video of a dental check-up online.
- Coming to visit the practice after hours.
- Entering the operatory and looking at different tools.
- Sitting in the dental chair.
- Letting the dentist examine their teeth with a mirror.

Tell-show-do

The tell-show-do technique is an evidence-based method for reducing anxiety in paediatric patients. It removes fear of “the unknown”, helps to desensitise the child to fearful stimuli, and gives them a sense of control. It has been shown to be successful even in emergency paediatric dental treatment, where pain and anxiety are often heightened.[6] When used alongside other techniques like virtual and audio-visual distraction, its efficacy is shown to be even greater.[7][8]

The tell-show-do process, to be repeated at each step of the procedure, is as follows:

- **Tell** the child what you are about to do.
- **Show** them what it involves.
- **Do** the action exactly as you have explained it.

The “show” step should be interactive with a sensory component, e.g., demonstrating the sound a piece of equipment makes, showing the child the materials you will use, or letting them touch or hold an object before using it. For younger children, pretending to demonstrate actions on their doll or teddy bear first can also be helpful.

Positive reinforcement

In order to learn the appropriate way to behave in any environment, children require feedback and positive reinforcement of desired behaviours. The dental operatory is no exception. Incorporate the following actions to utilise this technique:

- Use descriptive praise to highlight specific behaviours, rather than general praise. For example, choose “Thank you for keeping still. You’re doing really well!” over “Good job!”
- Use non-verbal reinforcement, such as smiling, nodding, or a “thumbs up”.
- Reward them for positive behaviours with a post-appointment prize, such as a sticker, small toy, or voucher.

Distraction

Distraction is an effective method of diverting the child’s attention away from the discomfort, anxiety, or boredom of a dental visit.[7][8][9][10] It is also successfully used to manage pain; given the significant psychological component of pain perception, it is theorised that diverting attention away from the source of pain can reduce perception and therefore intensity.[10]

Distraction techniques can be as simple as providing toys and story books in the waiting area, to the use of more innovative technology like virtual reality (VR) glasses. VR has been shown to reduce anxiety and pain perception in paediatric patients, with success in clinical scenarios ranging from rubber dam placement to extractions.[10][11][12][13]

Other examples of distraction techniques include:

- Making plug sockets and USB ports readily available for mobile phone charging.
- Installing a ceiling-mounted TV in the operatory and playing the child’s choice of cartoons, YouTube videos, or music channels.

- Allowing older children to connect their phones to the office system and play their own music.

Modelling

Modelling uses another child as a “role model”. The patient watches a cooperative sibling or another paediatric patient who exhibits desirable behaviour during a dental treatment, and sees the behaviour being praised and rewarded. The child then learns and imitates this behaviour during their own treatment.

Memory restructuring

Memory restructuring is especially helpful for reducing fear or anxiety in children who have had prior negative dental experiences.[14] Negative memories are turned into positive memories in a four-step process:

1. **Visual reminders.** The child is shown a “reminder” that they had a positive experience, such a photo of them smiling with their reward after the appointment.
2. **Positive reinforcement.** Verbalisation is used to reinforce the positive memory, e.g., “Do you remember how well you stayed still? You did such a great job!”
3. **Sensory encoding.** The child is asked to give a demonstration to add sensory context to the memory, e.g., “Show your dad how you stayed as still as a statue!”
4. **Sense of accomplishment.** The child is praised and feels a sense of accomplishment in relation to the memory.

Sensory-adapted dental environments (SADEs)

For children with anxiety or sensory processing difficulties, a sensory-adapted environment can greatly support relaxation and cooperation.[15][16] Examples of sensory adaptations include:

- Dimmed lighting.
- Moving projections.
- Soothing music.
- Sensory toys, e.g., beads, fidget spinners, stress toys.
- Weighted compression blankets.

Accompanying adults

For the safety of the young patient, it is vital that the dental professional is able to command their undivided attention. Parental interference – even well-intentioned encouragement – can be a distraction. If possible, encourage the accompanying adult to wait outside or stay quietly in the background for the duration of the treatment.

Remember that children take their behavioural cues from their parents, so any stress or anxiety shown by the caregiver can inspire the same feelings in the child. If the parent is uneasy, taking a moment to address their concerns can positively influence the child's behaviour.

Enhanced control

Dental treatment can make children feel powerless and vulnerable. Enhancing control gives the child choices, or even just the perception of choices, to help the child feel some agency over the situation.

A common method of enhancing control is to establish a system of non-verbal communication signals the child can use to control the treatment, such as a raised hand for "stop". This not only reduces the risk of the child using disruptive and potentially unsafe behaviours to pause treatment, it is also shown to reduce intra-operative pain perception.[17] Of course, it is important to respond to the signals quickly and consistently in order to maintain the child's trust and compliance.

Clinical strategies for managing paediatric patients

Examination techniques

For toddlers and babies, the knee-to-knee examination technique can provide safe restraint under which to conduct an examination. Parent and clinician sit facing each other and the child is laid across both laps, with the legs on the parent's lap and the head resting on the clinician's lap. Parents can also sit in the dental chair and position their child in front of them, comforting and restraining the child as necessary.

Complete analgesia

Pain is one of the most commonly cited reasons for dental anxiety and phobia, which often begin in childhood, so achieving complete analgesia should be a priority in paediatric patients.[4][18] Local anaesthetic is the gold-standard for pain management but the injection can be distressing in itself. The use of pre-injection topical anaesthesia is a safe, simple, and effective way to give a pain-free injection, potentially averting the onset of dental anxiety in the process.

Topical anaesthetic can also be used exclusively in minor procedures such as scaling, crown placement, or extraction of very loose teeth, eliminating the need for an injection altogether. However, topical anaesthesia should be used selectively over small areas in order to maintain control of plasma levels.

Minimally invasive techniques

In some cases of dental caries, cavities can be restored using the minimally invasive Atraumatic Restorative Treatment (ART) technique. Decay in the tooth is removed using a hand instrument as opposed to an electric drill, and no local anaesthetic is required, representing a much less traumatic experience for the child. Restorations typically use adhesive materials like glass ionomer cements, which demonstrate survival rates comparable to the those of conventional restoration materials.[19]

Sedation

Inhalation sedation using nitrous oxide and oxygen is a safe and effective option for children who need extra support to manage their anxiety, contain movement, suppress the gag reflex, or tolerate long treatments. It is also helpful in patients for whom adequate local anaesthesia cannot be achieved. It has a rapid onset and recovery, and can be easily titrated and reversed at the end of treatment. However, care must be taken when using inhalation sedation in conjunction with other sedative medications, and in children with certain medical conditions.

Cognitive behavioural therapy (CBT)

Researchers at The University of Sheffield have developed an approach based on the principles of Cognitive Behavioural Therapy (CBT), a therapeutic intervention that has had great success in patients with anxiety and phobias. They have published a number of resources for dental providers and parents to work through with young patients, consisting of simple activities that can be done at home and in the chair. You can find more information and resources [here](#).

[INTERVIEW] Treating Paediatric Patients - Dr. Michał Sobczak



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