

Pain-Free Dental Injection Technique

Ağrısız Dental Enjeksiyon Tekniği

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ABSTRACT Pain during dental injections remains a major source of anxiety and distress for children in dental practice. Effective pain-free dental injection (PaFein) therefore requires a combination of behavioral management strategies and refined injection techniques. This review chapter describes the determinants of pain-free dental injections in children by examining three interacting domains: child-related factors, injection-site related factors, and dentist-related factors. Contemporary behavior guidance approaches that enhance children's sense of control and self-efficacy are emphasized as key strategies for reducing anxiety and improving cooperation. From a technical perspective, pain can be minimized through appropriate topical anesthetic application, isolation and dehydration of the injection site, slow and pressure-controlled deposition of the anesthetic solution, and the creation of an anesthetic pathway by maintaining the needle tip within pre-anesthetized tissue during advancement. Techniques such as palatal and mandibular anesthesia and other injection methods can be performed with minimal pain or discomfort when these principles are followed. In addition, practitioner-related factors including communication skills, empathy, clinical experience, and self-efficacy play a crucial role in the successful administration of pain-free dental injections.

Keywords: Dental anxiety; pain-free; anesthesia, dental; self efficacy; child guidance; behavior therapy

ÖZET Dental anestezi sırasında hissedilen ağrı, çocuklarda diş tedavisine yönelik kaygı ve stresin en önemli nedenlerinden biridir. Bu nedenle çocuk diş hekimliğinde ağrısız enjeksiyon (PaFein-Pain-free Injection), davranış yönetimi stratejileri ile uygun enjeksiyon tekniklerinin birlikte uygulanmasını gerektirir. Bu bölümde çocuklarda ağrısız dental enjeksiyon, çocukla ilişkili faktörler, enjeksiyon bölgesi ile ilişkili faktörler ve diş hekimi ile ilişkili faktörler olmak üzere üç temel başlık altında ele alınmıştır. Çocuğun kontrol algısını artıran ve öz-yeterlilik gelişimini destekleyen modern davranış yönlendirme teknikleri, kaygının azaltılması ve uyumun artırılmasında önemli rol oynamaktadır. Teknik açıdan, yüzeysel anestezi uygulaması, enjeksiyon bölgesinin izolasyonu ve kurutulması, anestetik solüsyonun yavaş hızda ve düşük basınçla verilmesi ve iğnenin her zaman, önden anestezi yapılmış doku içinde kalması olarak tanımlanabilecek "anestezi sağlanmış yol" yaklaşımı, ağrıyı azaltmada temel prensiplerdir. Palatal, mandibular anestezi ve diğer dental enjeksiyonlar bu prensipler uygulandığında minimal ağrı ile yapılabilmektedir. Hekimlerin iletişim becerileri, empati düzeyi, klinik deneyimi ve öz-yeterlilik algısı ağrısız dental enjeksiyonların başarısında önemli rol oynamaktadır.

Anahtar Kelimeler: Dental anksiyete; ağrısız; anestezi, dental; öz yeterlik; çocuk rehberliği; davranış terapisi

In pediatric dentistry, management of anxiety, caries, and pain in children is of vital importance. Anxiety can be addressed through behavior guidance techniques (BGTs), caries management can be optimized using minimally invasive dentistry approaches, and pain control can be achieved through pain-free dental injection (PaFein) techniques.¹ Due to the strong correlation between anxiety and pain, truly pain-free dental injections cannot be achieved without effectively managing the child's anxiety. Sev-

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eral studies have demonstrated that anxious children report higher pain ratings compared with their non-anxious peers.²⁻⁵ Due to this strong correlation, the administration of local anesthesia, just like all other dental procedures, must begin with appropriate communication and effective anxiety management.

In a randomized clinical trial⁵ evaluating the effectiveness of the structured teaching model “PaFein” for delivering pain-free dental injections to children, significant reductions in pain scores were observed even among anxious children. The findings indicate that, when effective anxiety management strategies are combined with proper pain-free injection (PaFein) techniques, significant pain reductions can be achieved for all children.

Therefore, the determinants of a pain-free dental injection can be conceptualized as the integration of three domains:⁶

- A. Child-related factors: anxiety level and previous dental experiences
- B. Injection-site related factors and pain-free injection techniques
- C. Practitioner-related factors: knowledge, attitude, and clinical experience

CHILD-RELATED FACTORS

Dental fear, anxiety, and behavior management problems observed in children represent a multifactorial and complex phenomenon with diverse origins. Etiological factors may be broadly classified into three main categories: child-related personal factors, external environmental influences, and dentistry-related factors. Child-related personal factors include age, general fear and anxiety tendencies, temperament, and other associated behavioral or emotional difficulties. External factors encompass parental dental fear and anxiety, parenting style, and the broader socioeconomic and sociocultural context in which the child is raised. Dentistry-related factors primarily involve the experience of pain and the attitudes, communication style, and behavior of the dental practitioner and dental team. The relative importance of the individual components within these categories may change over time, and accordingly, a child’s anxiety levels and behavioral responses are not static but dynamic in nature. These problems may intensify as new contributing factors emerge, or alternatively, may diminish as the child develops coping strategies to manage existing stressors. Therefore, time itself constitutes a critical modifying variable.⁷

Many of the associated etiological factors cannot be fully resolved within the dental clinic setting; however, anxiety and pain are modifiable variables that can be effectively managed through strategies implemented by the dental practitioner and the dental team, supported by classical and modern behavior guidance techniques (enhanced control and self-efficacy) and principles of classical and operant conditioning principles as discussed thoroughly in Chapter 2 and Chapter 4.

MANAGING ANXIETY AND PREVIOUS NEGATIVE DENTAL EXPERIENCES

Anxiety is a feeling of distress characterized by an internally generated, vague sense of fear, uneasiness, and the apprehension that something bad may happen. It functions as a type of alarm response of the body in response to an actual or perceived threat. And pain is a subjective experience characterized by unpleasant sensory and emotional components, arising from actual tissue damage or the anticipation of potential harm.^{7,8} Strategies that enhance a child’s sense of control and self-efficacy have been shown to be effective in reducing anxiety by positively altering the emotional appraisal of pain, facilitating pain reduction, and improving cooperation. Therefore, in the pursuit of pain-free local anesthesia, contemporary approaches aimed at enhancing children’s self-efficacy and sense of control to reduce anxiety should be incorporated as adjunctive strategies alongside conventional behavior guidance techniques.⁶

ENHANCING CONTROL

In the dental environment, enhanced control in the context of pain-free local anesthesia refers to providing objective control to the child, meaning that the child is given the freedom to interrupt the clinician at any time if fatigue or discomfort is felt. Shifting the locus of control toward the child, in line with the concept of enhanced control, allows the child to actively influence sensations such as taste of the anesthetic solution, pressure or discomfort during the injection.^{6,9}

Enhanced control should not be introduced only when pain is expected. Instead, the clinician should present possible sensations in a planned order, starting from non-noxious and moving gradually toward noxious stimuli. Pain should be discussed only at the final stage to avoid creating anticipatory anxiety. The dental practitioner may first mention neutral or mildly unpleasant sensations, such as fatigue from keeping the mouth open, the need for a short break, or an unpleasant taste in the mouth. Children may

initially use their “freedom to stop the practitioner” more often until trust is established; therefore, the clinician must always respond quickly and consistently when this freedom is used.^{6,10}

Enhanced control can be supported by signaling methods, including physical signals (such as raising a hand) or vocal signals, such as saying “aaaa” or “hmmn” sound generated posteriorly in the oropharynx. Vocal signaling is often more acceptable to children because it is a natural reaction when discomfort or pain is felt. The dental practitioner should remind the child regularly that this option is available. In addition to giving control, vocal signaling may also act as a distraction, transforming a spontaneous pain reaction into a deliberate action. In this way, vocal signaling can contribute to active pain control during dental treatment.⁶

DEVELOPING SELF-EFFICACY

Perceived self-efficacy, defined by Bandura refers to an individual’s belief in their ability to cope successfully with a task, independent of actual performance. It is a key factor influencing how individuals experience dental treatment.¹¹ In a study conducted by Litt et al. during surgical wisdom tooth extraction, participants were given false positive feedback about their ability to induce physiological relaxation. Although their actual relaxation performance did not improve, participants who believed they were capable of relaxing experienced significantly lower anxiety and distress during surgery. Notably, this group showed better emotional outcomes than the control group, which received sedation but did not report lower anxiety or improved coping. These findings highlight that perceived competence, and control may be more influential than pharmacological support alone in reducing anxiety during dental procedures.^{12,13}

In clinical practice, self-efficacy develops primarily through successful performance experiences. Small, achievable successes during a dental visit increase confidence, while early failures may reduce it. Verbal encouragement from the dental practitioner also plays an important role, particularly when it is sincere and supported by the child’s own experience. During the first appointment, both children and parents are often concerned about whether the child will manage the treatment. Providing early, simple successes—such as allowing the child to practice opening the mouth wide, tolerate suction briefly, or remain still for a short period—helps reduce these concerns and builds confidence for subsequent steps and future visits.⁶

Importantly, beyond actual performance, the child’s perception of competence during the examination plays a critical role in reducing distress and pain. As previously reported by Litt et al., the use of false positive feedback may also be beneficial in situations where actual performance is limited or not yet optimal. This stage functions as a warm-up session, during which self-efficacy is gradually built through recognition of even minimal positive progress.^{6,12}

Throughout the session, the child should receive continuous positive reinforcement, including verbal, vocal, and non-verbal praise, following each successful step. Verbal praise may include statements such as “I am very impressed with how wide you can open your mouth, like a lion” and may also involve acknowledging the child’s cooperation to the parents. At this stage, the manner in which verbal praise is delivered vocally is also important. The practitioner’s tone, volume, and pitch should be calm, reassuring, slow, and warm, rather than hurried or overly excited. This reinforcement should be further supported by non-verbal cues, such as smiling, nodding, a gentle touch on the shoulder, or a thumbs-up gesture. Creating an early and sincere “atmosphere of success,” particularly in the presence of parents, is essential.^{6,14,15}

The dental environment, including the dental team, instruments, and medicaments—often unfamiliar due to medical clothing, shapes, and odors—should be introduced to the child gradually. This introduction should follow a procedural hierarchy, progressing from familiar, friendly, and simple elements (e.g. dental mirror, cotton rolls) to those perceived as unfamiliar, threatening, or difficult (e.g. tweezers, dental burs, syringes) while simultaneously supporting the child’s sense of control.⁷ The combined use of enhanced control and the development of self-efficacy is crucial. Even though the child gets positive feedback from the dental practitioner regardless of their actual performance, the dental practitioner should also be able to get feedback from the child with the help of enhanced control technique to learn the child’s limitations and concerns. This interactive and stepwise approach also functions as an exposure phase within a desensitization strategy, particularly for children with previous negative dental experiences.⁶

PROCEDURE

Children may exhibit anxiety due to previous dental experiences or develop a fear of dental injections following a painful injection experience. In such cases, an extinction procedure based on classical conditioning should be implemented even before the injection session.^{6,14}

To extinguish syringe-related fear, the syringe may be introduced using the tell–show–do technique, without administering an actual injection, during a preparatory rehearsal phase—hereafter referred to as the “pre-sleep” phase—prior to any anesthetic delivery. During this phase, the practitioner may simulate the injection procedure in a rehearsal-like manner, similar to how actors rehearse before a stage performance. The process may begin by placing a cotton roll on the gingiva, without the need for topical anesthesia at this stage. While holding the cotton roll, verbal reinforcement, such as “I like how still you are sitting, like a statue,” may be used to enhance the child’s self-efficacy. Additionally, addressing the parents with positive remarks, such as “Your child is helping me a lot,” may further strengthen the child’s confidence and serve as a distraction.⁶

Subsequently, the capped syringe can be gently placed in the child’s mouth to allow familiarization with the device. Importantly, beyond actual technical performance, the child’s perception of competence during the procedure plays a critical role in reducing distress and pain. As previously reported by Litt, et al, the use of false positive feedback may also be beneficial in situations where actual performance is limited or not yet optimal.¹² This rehearsal “pre-sleep” procedure acts as a preparation for real injection during which self-efficacy is gradually built through recognition of even minimal positive progress.

Once the tooth has been successfully placed into a “pre-sleep” state, the child should again receive social reinforcement, such as verbal praise or gentle physical reassurance. The session may conclude with material reinforcers, including stickers or small toys. At this stage, again a sincere “atmosphere of success” should be shared by all involved, including the parents, by explicitly acknowledging each successful step (e.g., “We counted all the teeth, we started cleaning them, and we put the tooth into pre-sleep, ready for sleep next time”).¹⁴

In subsequent visits, verbal persuasion by the practitioner is likely to be more effective in further strengthening the child’s self-efficacy, as it builds upon previously promised and successfully achieved performance.¹¹ This progressive process may be metaphorically described as “turning a cat into a lion,” reflecting the gradual transformation of a fearful child into a confident and cooperative participant through repeated positive experiences.

INJECTION SITE RELATED FACTORS AND PAIN-FREE INJECTION (PAFEIN) TECHNIQUES

Pain during injection administration may result from i) mucosal puncture by the needle, ii) advancement of the needle within the soft tissue, iii) and the pressure, and temperature of the anesthetic solution during deposition.

Pain caused by mucosal puncture can primarily be reduced through the use of topical anesthetics, as described in the following paragraph. Additionally, the use of fine 30G needles with a double-bevel design has been reported to cause less pain than regular or triple-bevel needles.¹⁶ Pain associated with needle advancement can be minimized by creating an “anesthetic pathway,” which involves keeping the needle tip within the pre-anesthetized tissue during advancement. This approach helps prevent nociceptor stimulation and reduces the likelihood of pain.¹⁷ The anesthetic pathway technique will be described in the following paragraphs. However, this technique is effective only when the room temperature anesthetic solution is injected slowly, in a controlled manner, and with minimal tissue pressure.¹⁷⁻¹⁹ For safe and pain-free local anesthetic administration, both expert consensus¹⁷ and computer-controlled delivery systems recommend injection rates ranging from 0.20–0.36 mL/min, with some devices allowing rates up to 1 mL/min. In clinical practice, this corresponds approximately to delivering one drop of solution every 5–6 seconds.

PAIN-FREE INFILTRATION ANESTHESIA BY CREATING AN ANESTHETIC PATHWAY

Pain-free dental injection techniques have previously been described in the literature.^{6,17,19} The following sections summarize the clinical steps for infiltration anesthesia and related injection techniques. In order to provide pain-free injections prior to technical precautions, effective anxiety control is a prerequisite.⁶ Subsequently, all dental injections should begin with the application of a topical anesthetic agent. When appropriately applied, topical anesthetics provide anesthesia to approximately 1–2 mm depth of the mucosal surface; therefore, their use is essential to prevent any potential association between the syringe – needle and a pain response during needle penetration into the soft tissue.^{18,20} As discussed in Chapter 2, once a child associates the sight of a syringe with pain, a conditioned pain response may develop, leading to anxiety or distress during future injection attempts—even in the absence of tissue contact or solely upon visual exposure to the approaching syringe due to perceived threat.

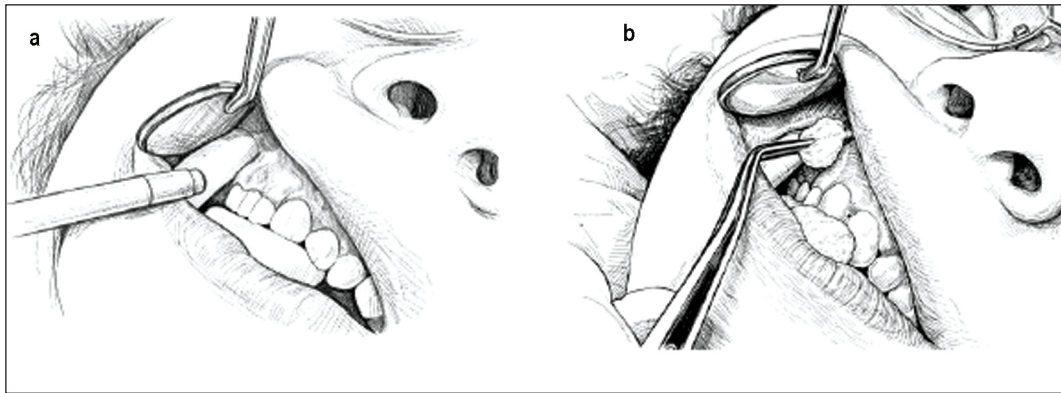


FIGURE 1: a: Isolation and dehydration of the injection site. Carefully positioned vertical and horizontal cotton rolls are used to ensure adequate isolation. The child is instructed to gently bite on the horizontally placed cotton roll to prevent displacement during the procedure. b: The topical anesthetic should either be soaked on a nut-sized cotton or cotton swab and held on the tissue for a minimum of 2 minutes.

Prior to topical anesthetic application, the injection site should be isolated using cotton rolls and adequately dried with an air spray to enhance absorption of the anesthetic solution (Figure 1a). Cotton rolls help prevent rehydration of the tissue by saliva and, more importantly, minimize leakage of the anesthetic solution to neighboring sites. Such leakage may be perceived as an unpleasant taste or may result in unintended diffusion of the topical anesthetic to the tongue or throat, potentially causing discomfort.^{17,18,20} To detect any potential discomfort, children should be regularly asked for feedback and encouraged, through enhanced control, to report any unpleasant sensations. This freedom should be provided not only during topical anesthetic application but also consistently throughout routine injection procedures.^{6,19}

The topical anesthetic should be applied to the alveolar mucosa below the attached gingiva. This region is pre-

ferred because the tissue is non-keratinized and relatively loose, resulting in lower tissue resistance and facilitating anesthetic solution deposition with minimal injection pressure. The topical anesthetic-soaked cotton swab or cotton pellet should be held against the dehydrated mucosa for at least 2 minutes (Figure 2). Following application, transient superficial wrinkling of the vestibular mucosa may be observed, indicating the onset of topical anesthetic action.^{6,17-20}

Following the application of topical anesthesia, the tissue is gently stretched using a dental mirror or finger support. The needle is positioned at approximately a 20° angle, with the bevel facing the pre-anesthetized tissue (Figure 2a). The injection should begin slowly before tissue penetration, allowing a minimal amount of anesthetic solution to diffuse into the tissue without creating pressure (Figure 2b), until a slight tissue elevation (bleb) or blanching is observed. Subsequently, the needle is advanced

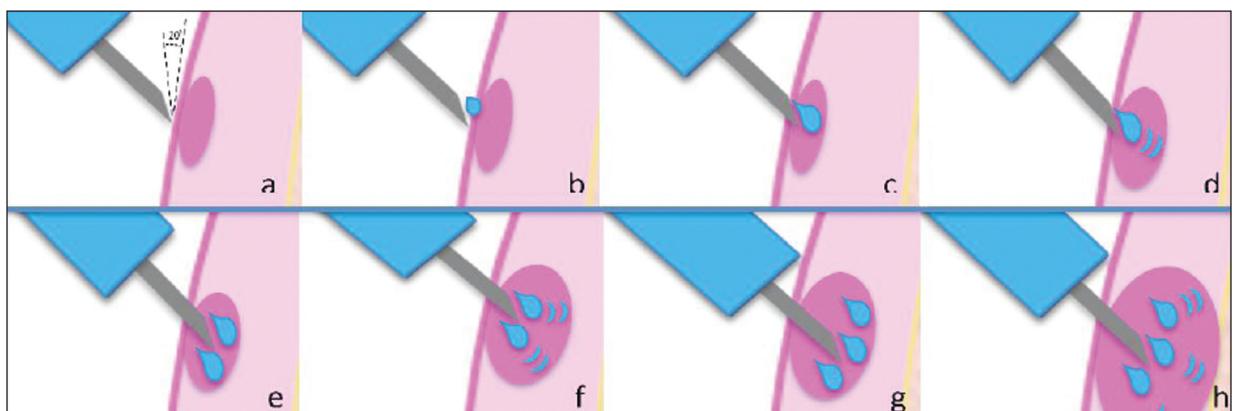


FIGURE 2: Creating an anesthetic pathway for pain-free infiltration anesthesia (Pink circle indicates the pre-anesthetized tissue)

slowly (approximately 0.5–1 mm) into the tissue that has been superficially anesthetized by the topical agent and the local anesthetic solution is injected at a low rate; one or two drops are sufficient for the initial deposition (Figure 2c). After a short pause to allow the solution to diffuse and increase the depth of anesthesia (Figure 2d), the needle is advanced slightly further within the anesthetized tissue and a small additional amount of solution is deposited (Figure 2e), followed by another brief pause (Figure 2f). Once sufficient tissue anesthesia and slight tissue expansion are observed (Figure 2g), the remaining solution can be deposited at the suprapariosteal level at a moderate rate (Figure 2h).

Maintaining the needle tip within the pre-anesthetized tissue at all times is the key principle of this technique. Continuous feedback from the child, achieved through enhanced control, is also essential to ensure pain-free injection. The practitioner should instruct the child to signal or ask the practitioner to stop whenever they notice a bad taste, feel tiredness or discomfort, or experience a slight pinching sensation (avoiding the explicit use of the word “pain” in the initial instruction).

INDIRECT PALATAL/LINGUAL ANESTHESIA (TRANS-PAPILLARY ANESTHESIA)

Indirect palatal/lingual anesthesia using the trans-papillary technique has been previously described in the literature.^{6,18-20} The following section combines and modifies previously described techniques and presents them in a step-by-step format, supplemented with schematic figures, clinical case photographs, and practical behavior guidance recommendations to facilitate clinical implementation.

STEP 1 – BUCCAL OR LABIAL INFILTRATION

Preparatory infiltration anesthesia is first administered to anesthetize the buccal/labial side of the interdental papilla.

A minimum of 0.5 mL of anesthetic solution should be deposited using needles at least 12–13 mm in length, following the principles of the anesthetic pathway 6,17, enhanced control, and self-efficacy development techniques described above.

STEP 2 – TRANS-PAPILLARY ANESTHESIA

Trans-papillary anesthesia is then initiated from the pre-anesthetized buccal/labial side of the interdental papilla (Figure 3a, Figure 4a). Before needle insertion, the approximate level of the alveolar crest should be considered to ensure that the needle can be advanced trans-papillary without crestal bone interference. After positioning the syringe perpendicular to the long axis of the tooth, the needle is inserted 1–2 mm into the pre-anesthetized papillary tissue (Figure 3b). A minimal amount of anesthetic solution is deposited slowly (Figure 3c) to create the initial anesthetic pathway.

STEP 3 – PAPILLARY ADVANCEMENT

After a brief pause to allow the buccal surface of the papilla to become adequately anesthetized, the needle is advanced 1–2 mm into the interpapillary region (Figure 3d, Figure 4b), perpendicular to the long axis of the tooth, while maintaining the needle tip within the pre-anesthetized area (Figure 3e). If the child reports any discomfort through enhanced control, further advancement of the needle should be stopped, and the needle should be withdrawn slightly.

STEP 4 – ADVANCEMENT TOWARD PALATAL/ LINGUAL TISSUE

An additional amount of anesthetic solution is deposited (Figure 3e). If the child reports any discomfort through enhanced control, indicating excessive pressure during in-

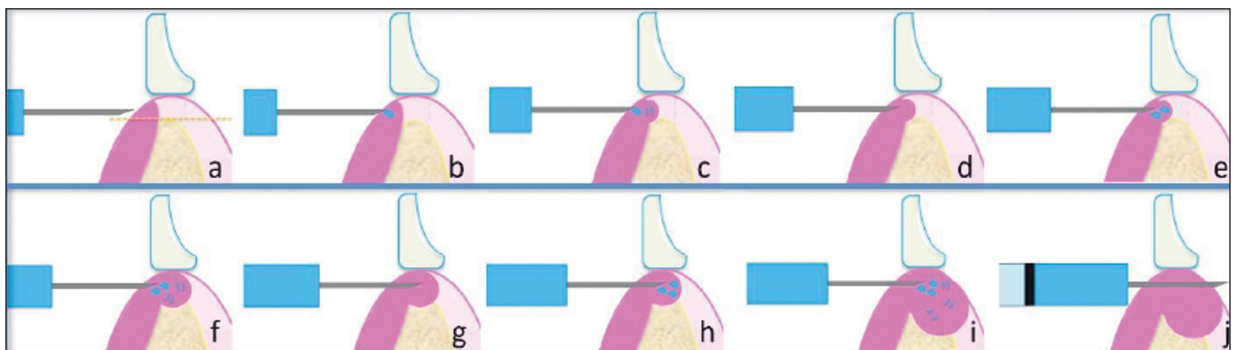


FIGURE 3: Indirect palatal/lingual anesthesia (Transpapillary Anesthesia) by creating anesthetic pathway



FIGURE 4: Indirect palatal anesthesia

jection, further deposition of the anesthetic solution should be stopped immediately. After a brief pause, the needle is slowly advanced further toward the palatal (or lingual) side (Figure 3f, g, Figure 4c).

STEP 5 – TISSUE BLANCHING AND INDIRECT PALATAL ACCESS

At the opposite palatal or lingual papillary site, after enough anesthetic deposition (Figure 3h) blanching of the coronal gingival tissue should be observed. Localized blanching compared with surrounding tissues indicates that the anesthetic solution has diffused and anesthesia is developing at the target site (Figure 3i, Figure 4c). After further advancement, the needle tip becomes visible on the palatal/lingual side (Figure 3j, Figure 4d).

STEP 6 – OPTIONAL DIRECT PALATAL INJECTION

If necessary, the anesthetic field can be expanded by administering a conventional palatal injection using a direct approach, depositing more anesthetic within the previously anesthetized tissue.

Pain-free inferior alveolar nerve block, tuber anesthesia, incisive, intra-ligamentary and intra-osseous injections can also be achieved using similar applications of the

anesthetic pathway technique (Figure 5), either with or without preparatory infiltration anesthesia. These procedures should be performed following topical anesthesia and at all times in combination with enhanced control and self-efficacy development techniques.

PRACTITIONER-RELATED FACTORS: KNOWLEDGE, ATTITUDE, AND CLINICAL EXPERIENCE

Communication skills, clinical knowledge, experience, self-efficacy, and empathy play a critical role in reducing children’s anxiety and facilitating pain-free local anesthetic administration. The practitioner’s attitude and behavior during dental treatment strongly influence a child’s perception of pain and cooperation. Dental practitioners should avoid rushing through appointments, displaying impatience, or providing insufficient explanations.

Instead, they should allocate adequate time to communicate with both the child and the parent, clearly explain procedures, and address uncertainties. Empathetic communication, reassurance, and clear, age-appropriate instructions have been shown to reduce anxiety and promote cooperation during dental procedures.^{9,21,22}

In addition to behavioral and communication skills, practitioners must also develop appropriate technical competence in local anesthetic administration. Dental practitioners are therefore encouraged to continuously refine their technical skills and manual dexterity. Holding the syringe in a palm-up position and supporting it with the ring finger* (Figure 6a) can provide improved control during injection. Furthermore, stabilization of the operator’s arm by resting the elbow against the operator’s own body or chest (Figure 6b), together with the use of finger and cheek rests (Figure 6c), is important to minimize the length of the lever arm between the shoulder and the needle tip where no support is present. Finger rests on the patient’s face or chin are acceptable; however, performing injections without support or relying on support from the patient’s shoulder or arm should be avoided.¹⁷

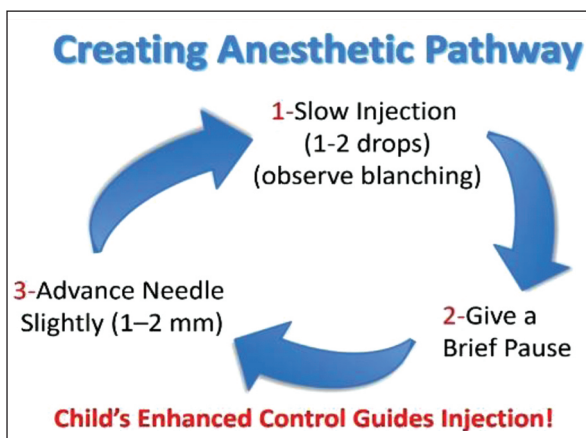


FIGURE 5: Steps of creating an “Anesthetic Pathway



FIGURE 6: Hand position (a) and elbow-finger-syringe rest points (b, c)

Evidence suggests that increased clinical exposure to dental injections during dental training—particularly through simpler procedures such as buccal infiltrations performed in cooperative and low-anxiety patients—can contribute to the development of self-efficacy among undergraduate and postgraduate dental students.^{22,23}

In a randomized controlled trial, Kuscü et al. evaluated the effectiveness of the PaFein teaching model for pain-free injections among ten young postgraduate dental students who performed 30 different injections for the dental treatment of children. The findings revealed that participation in a 9-hour teaching program on behavior guidance and pain-free injection techniques improved participants' skills in administering dental injections. Postgraduates who attended the teaching program delivered injections that were significantly less painful than those performed by the control group, even in anxious children.⁵

Mastering PaFein techniques involves a learning curve. Practitioners should initially gain experience with basic and less painful injection procedures before progressing to more technically demanding and potentially painful injections, such as inferior alveolar nerve blocks and palatal/lingual injections. When possible, early practice may be conducted on peers rather than patients, or with cooperative adults and low-anxiety children, allowing clini-

cians to refine their technical skills and communication strategies before performing these procedures in more challenging clinical situations.²⁴

CONCLUSION

Pain-free dental injections can be achieved using the PaFein technique through the careful integration of effective communication and refined clinical skills. Children's anxiety should be alleviated using both traditional and contemporary behavior guidance techniques, particularly enhanced control and the development of self-efficacy. The injection site should first be dehydrated with an air spray and isolated with cotton rolls, followed by a minimum of 2 minutes of topical anesthetic application. Subsequently, slow and pressure-controlled deposition of the anesthetic solution into pre-anesthetized tissue, by creating an anesthetic pathway, facilitates the pain-free administration of various types of dental injections.

Continuous feedback from children should be encouraged throughout the procedure to maintain their perception of control. Practitioners should also recognize the presence of a learning curve in the application of pain-free injection techniques and therefore invest careful and patient effort in developing both their communication abilities and practical clinical skills.

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