

Non-Pharmacological Approaches to Behaviour Management in Children

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Abstract: This review examines a number of non-pharmacological approaches to the management of dental anxiety and its manifestations among children and young people. The article concludes with recommendations regarding the use of non-pharmacological approaches.

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Clinical Relevance: Treatment of anxious children is challenging for the dentist.

Fear of dentistry is common both in adults and in children. Amongst children, dental anxiety may manifest as disruptive or non-compliant behaviour. It has been estimated that 13% of children show reluctance to attend their first dental treatment, and 11% react negatively during the treatment. Management of the dentally anxious patient is challenging for the dental practitioner.

The American Academy of Pediatric Dentistry has outlined ten behaviour-management methods for use with children:¹

- voice control;
- tell–show–do;
- positive reinforcement;

- distraction;
- non-verbal communication;
- hand over mouth technique;
- physical restraint;
- conscious sedation;
- nitrous oxide;
- general anaesthesia.

The last three of these methods are based upon the pharmacological management of the child's behavioural manifestations, and will not be the main focus of this article. To this list, Kuhn and Allen added three techniques:²

- contingent distraction;
- modelling;
- contingent escape.

This review will also examine the following procedures:

- relaxation training;
- hypnosis;
- systematic desensitization.

These methods are intensive of dental practitioner time, and are unlikely to be suitable for use in settings where time is limited. However, they may be of

value in the management of the severely dentally anxious child.

VOICE CONTROL

The use of volume and pitch has been tested with child dental patients. Where the voice is moderately loud and deep, adherence is increased and disruptive behaviour is decreased.³ Interestingly, children who receive loud commands report more pleasure in the interaction than the control group.

TELL-SHOW-DO

A commonly used and popular method, tell–show–do, is recommended for introducing children to dental equipment and procedures. The procedure takes place in three phases:

- the *tell* phase involves an age-appropriate explanation of the equipment and/or procedures;
- the *show* phase is used to demonstrate the procedure up to the point where the instrument is actually used (this may involve using an inanimate object to substitute for the child or a part of the child – for example ‘polishing’ a model tooth);
- the *do* phase follows.

It has been suggested that for maximum anxiety reduction the show–do gap should be brief. Generally tell–show–do should not be used when giving children injections because the sight of a needle is judged to be too frightening for the child.

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POSITIVE REINFORCEMENT

Based upon psychological theories of learning, positive reinforcement refers to the use of rewards to increase compliant behaviour. Psychologists studying human learning have discovered that behaviour is maintained in part by its consequences. If a behaviour is followed by certain consequences, then the likelihood of that behaviour is increased in the future. If the consequence results in the probability of a behaviour being increased, we term that consequence a 'reward'. For example, giving a child stickers following compliant behaviour increases the likelihood of future compliance: the sticker is a reward. Rewards can be positive or negative.

- A *positive reward* is something which increases behaviour when it is given – for example, the sticker increases behaviour when the child is given it.
- A *negative reward* increases behaviour by being removed – for example, avoidance behaviour is often rewarded by removal of the feared stimulus. The behaviour of running away is increased by removal of the stimulus (the feared dental setting).

One of the most effective and important rewards for children is attention and praise. Children can be highly motivated to seek attention from an adult. However, in the dental surgery disruptive children often receive more attention (reward) than non-disruptive children.

A 'punishment' is any consequence that results in a decrease in the likelihood of a behaviour: for example, saying 'No' to a child in a loud firm voice results in the child ceasing disruptive behaviour.

Punishment can be positive or negative. A punishment that decreases behaviour by its application is termed 'positive'. One that decreases behaviour by removal of something is termed 'negative' – an example would be taking a child's toy away until the

disruptive behaviour ceases.

Note that 'reward' and 'punishment' are defined by their consequences on behaviour, not by the intrinsic properties of the object.

Positive reinforcement is commonly used as a management strategy. It is intuitively simple and familiar from everyday life. Where the technique appears to be ineffective, this may be related to the common problems outlined below.

Identification of Reinforcers

There are few things that are inherently rewarding. The choice of reward should be based on the individual child. Parents are a good source of information about what children like, and what can be used to induce compliance.

Reward Saliency

A child may find something (for example stickers) rewarding in some contexts but not others. The severity of the child's fear may block the ability of a weak reinforcer. For example, a child might not be prepared to risk dental treatment 'just' for a sticker.

Reward Fade

If a child receives the same reward too often its power as a reinforcer will fade. For example, a child can only eat so many sweets, and after a while stickers will start to lose their attraction. Using praise and attention as rewards will generally insure against reward fade.

Contingency Management

In order to be most effective, rewards should be closely associated with the behaviour they are trying to change, and the association of reward and behaviour should be apparent. Younger children generally find rewards that are far removed from the behaviour more difficult to understand.

DISTRACTION

Shifting the attention of the anxious patient away from the anxiety-provoking stimulus is a technique which many child patients and their carers report

using spontaneously. Distraction is probably most effective when anxiety is mild. Several types of distraction have been reported in the literature, including the use of video-taped cartoons, audio-taped stories and video games.⁴ Distraction techniques have been found to be as effective as relaxation-based techniques, and better than no intervention. Audio-taped distractions are more effective than video-taped, possibly because they allow children to close their eyes and hence avoid the feared stimulus.⁴

The most significant reductions in anxiety-related behaviour are found when the distracting material is made contingent on co-operative behaviour. This technique is termed *contingent distraction*. Children shown cartoons that were stopped if they became unco-operative showed less than half the levels of disruptive behaviour than those shown cartoons regardless of their behaviour.⁴ This is similar to using the cartoons as a reward (see above).

Cognitive distraction, in which the patient is encouraged to think about something other than the dental situation, has been shown to be effective in adults. However, evidence suggests that the technique is only useful if the patient understands that it is likely to reduce anxiety.⁵

NON-VERBAL COMMUNICATION

Non-verbal communication is a broad concept, which includes a range of communications through means other than words. In relation to the management of dentally anxious children, two approaches have been identified: the dentist's use of reassuring touch, and the child's use of stop signals.

Gentle physical contact before treatment has been found to reduce anxiety in a wide range of patients, including dentally anxious children.⁶

Stop signals are commonly used in general practice; the patient makes some agreed signal (usually raising the hand) to indicate that he or she would like a break from treatment. Although a

non-verbal communication, this technique involves a number of psychological components including building trust in the dentist–patient interaction and providing the patient with a sense of control. The technique has been shown to be effective in reducing a patient’s experience of anxiety even if he or she does not use the signal.⁷

HAND OVER MOUTH

It is generally agreed that this technique should be used only sparingly and with children below the age of 6 years. Without proper consent the use of hand over mouth is potentially an assault and the technique cannot be recommended for use by general dental practitioners. The objectives of the technique are to establish communication with the child, to eliminate inappropriate avoidance behaviour and to ensure the child’s safety during the delivery of care. Hand over mouth techniques take one of two forms – either with or without airway restriction. Both techniques involve both restraint of the child and punishment (release is contingent upon the child ceasing the non-compliant behaviour).

The use of hand over mouth or hand over mouth with airway restriction has always been controversial, with much discussion focussing on the long-term effects of the use of the technique (for example see the summary of this debate by Acs *et al.*⁸). In general, the use of techniques that may result in the child experiencing a loss of control over the dental situation has been found to lead to dental fear and an unwillingness to return to the dentist later in life.

Surveys of American dentists show that use of this technique is declining,⁸ largely as a result of fears concerning its legality. An unpublished survey of paediatric specialist dentists in the UK found that most specialist paediatric dental practitioners do not advocate the use of hand over mouth.

PHYSICAL RESTRAINT

Physical restraint involves the dentist or

an assistant holding the patient or the use of special restraining devices such as the Papoose Board or Pediwrap, which have been recommended for use with young children (aged 3 or 4). The Papoose Board and the Pediwrap both consist of a cloth attached to a stiff board. The child is placed on the board, the cloth is wrapped around them and tied with Velcro strips. The child’s arms are restrained inside the cloth. Though there are few data available on actual levels of use, most paediatric dental specialists report that these devices are not used in the UK. The child is restrained by being held by the dentist, an assistant or the child’s carer, particularly young children below school age.

MODELLING

The technique of modelling assumes that individuals learn about their environment through observation, in particular that learning can occur through observing the behaviour of others and the consequences of their behaviour. This approach is used to reduce disruptive or anxious behaviour through encouraging the child to learn the appropriate response to the dental situation by observing another person undergoing treatment.

Modelling is most effective if:

- The model observed shares important characteristics with the target child (for example the model is the same gender and a similar age).
- The model is observed to enter, complete and exit treatment without adverse consequence.
- The model is rewarded for his/her behaviour (through material rewards such as stickers or toys, or by praise from the dentist).
- A model who is seen to be mildly anxious but who ‘copes’ is more effective than one who appears to be completely unafraid.

Modelling may take many forms. The model may be real – actually in the surgery with the anxious child – or virtual, for example observed on film or videotape. Virtual models are generally

less effective than real models.

Participant Modelling

Participant modelling extends the modelling procedure to include requesting the child to engage in the behaviour which he or she has observed immediately following the model. This technique has been used with some success in dentally anxious adults but not with children.

CONTINGENT ESCAPE

Kuhn and Allen² propose the use of contingent escape for providing patients with dental anxiety some control over their dental routine. The technique involves giving the child praise and brief escape (5 seconds) from dental treatment contingent upon his/her lying still and quiet. Disruptive behaviour delays escape until the child co-operates. Kuhn and Allen report rapid improvements in disruptive behaviour with this technique, even in relatively young children.² The technique uses the principles of behaviour change outlined above, using escape from the dental treatment as a reward. This approach need not result in prolonging treatment.

However, many practitioners may find this approach difficult, because it requires treatment to be continued while the child is being disruptive, and only to stop when the child is co-operative. Often it is easier to do the reverse.

REDUCING THE UNCERTAINTY IN A SITUATION

Situations that contain a great deal of uncertainty are generally anxiety provoking, and approaches based on reducing the degree of uncertainty will generally reduce anxiety levels. Children may understand little of the nature of dental treatment and may even have active misconceptions. Many of the approaches to reducing anxiety involve some element of reducing uncertainty – for example, modelling allows the child to observe treatment, and the tell–

show–do technique similarly provides some guidance on the nature of the dental visit. Provision of preparatory information to parents due to bring their children for their first dental visit appears to increase the patient's co-operation.⁹

RELAXATION TRAINING

Simple training in relaxation is effective in reducing anxiety of adults in dental settings but there has been little research using this technique in children. This may be because most relaxation treatments take some time, and because the patient needs to pay attention to instructions for a prolonged period. This is particularly true of techniques such as progressive muscular relaxation.

Most techniques of relaxation, though aimed at reducing the physical manifestations of anxiety (hyperventilation, muscle tension), do involve other elements that are known to reduce anxiety, such as distraction and cognitive avoidance.

HYPNOSIS

Controversy exists regarding the exact nature of hypnosis. Most researchers and clinicians agree that hypnosis involves two elements – a state of mental relaxation and a state of restricted awareness of the immediate environment – although there is less agreement concerning the nature of the hypnotic state. Essentially there are two viewpoints – one maintains that the hypnotized individual does not experience an altered state of consciousness and is essentially the same as when they are not hypnotized (although more deeply relaxed); the other maintains that hypnosis involves an altered state of consciousness. It has been suggested that it is impossible to differentiate these two positions empirically.

Whatever the nature of hypnotic state, hypnosis has been used widely in dental settings, although very few trials have included control groups or adequate sample sizes.¹⁰ Summarizing

the literature in adults, Kent and Croucher suggest that hypnosis is probably most effective in those patients who are willing to co-operate with treatment.¹⁰ Hypnosis has no apparent advantage over relaxation treatments. Very few studies have examined the use of hypnosis in the treatment of dentally anxious children. There is some feeling that techniques which relax children should be effective in improving co-operation and, to the extent that techniques involved in hypnosis result in relaxation, their use could be justified.

SYSTEMATIC DESENSITIZATION

For the child with severe dental anxiety, avoidance and extreme distress psychological approaches based on the systematic introduction of the feared stimulus may be appropriate. Systematic desensitization is an approach to phobic anxiety which has been adapted to a great many fears and phobias, and for both children and adults. The method works on the principle of graded exposure to the feared stimulus, together with training in relaxation. There are four steps:

1. The history of the problem is identified, including any events thought to have precipitated the fear, the consequences the fear has for the individual's lifestyle and health, and the individual's goals for the treatment.
2. The individual is taught a relaxation method such as progressive muscular relaxation.
3. A hierarchy of fears is identified. The individual is asked to list a number (usually 10) of feared objects or experiences, ranging from something they find mildly frightening but probably could do before treatment to something they find very frightening but would like to be able to do at the end of treatment.
4. Pairing of hierarchy items with relaxation. Over a period of weeks the patient undertakes, with the aid

of his/her therapist, to carry out each item in the hierarchy of fears whilst practising the relaxation skills. It is important that the patient completes each item on his/her list, whilst maintaining a state of relaxation before moving on to the next item.

A common problem with systematic desensitization is the size of the hierarchy steps. Often steps that look small when the individual is listing them turn out to be much bigger when it comes to treatment. In this case, the correct approach is to break the steps down into smaller steps. For example, item 4 in the hierarchy might be 'Making an appointment at the dentist' and item 5 'Having a check up'. While this may seem logical, it may be that there are several steps between 4 and 5 that can make the transition easier – such as sitting in the waiting room, sitting in the chair, looking at the instruments.

A key component of treatment is the avoidance of extreme levels of anxiety. The exposure to the feared object must be gradual and allow the patient gradually to learn that the feared object is safe.

Systematic desensitization is a highly effective approach to the treatment of highly anxious children. It should be considered when the child's level of anxiety is interfering with his/her health and lifestyle (for example avoidance of dental treatment has resulted in severe levels of disease and pain). Referral to a clinical psychologist to carry out the treatment is recommended. However, the principles of gradual exposure to feared objects and use of rewards can be applied to less severe anxiety.¹¹

CHOICE OF MANAGEMENT METHOD

The choice of method of management will be influenced by various factors, including the severity of the child's dental anxiety and the setting in which the intervention takes place (including the time available). Table 1 summarizes the approaches that might be adopted. Techniques such as modelling and

	Time-limited setting (e.g. general dental practice)	Settings where more time may be available (e.g. community dental setting)	Non-dental settings
Mild level of anxiety/ behavioural disruption	Voice control, positive reinforcement, tell-show-do, distraction, non-verbal communication	Voice control, positive reinforcement, tell-show-do, distraction, non-verbal communication	Unlikely to be seen in this setting
Moderate level of anxiety/ behavioural disruption	Voice control, positive reinforcement, tell-show-do, distraction, non-verbal communication	Voice control, positive reinforcement, tell-show-do, distraction, non-verbal communication, modelling	Unlikely to be seen in this setting
Severe phobic anxiety and avoidance	Unlikely to be seen in this setting	Modelling, relaxation, hypnosis	Modelling, relaxation, hypnosis, systematic desensitization

Table 1. Choosing between methods. The impact of severity of anxiety and setting on choice of approach to the management of dentally anxious children.

systematic desensitization are time intensive and require specialized equipment or knowledge. Systematic desensitization is highly effective for phobic anxiety, and unnecessary for lower levels of anxiety. Within the dental surgery, and where children have mild or moderate levels of anxiety, techniques that decrease the uncertainty and distract the child from the immediate stimulus are most effective.

PERCEIVED ACCEPTABILITY AND HUMANITY OF TREATMENTS

A patient’s perceptions of the humanity and acceptability of treatment are important in the evaluation of treatments, and should be used by the clinician to guide treatment decisions. This is particularly true when treatments such as behaviour management are considered. Relatively few studies have empirically evaluated the acceptability of approaches to the management of dental anxiety. The parents of anxious children generally perceive techniques involving physical restraint (the Papoose Board, hand over mouth) as less acceptable than techniques which do not involve restraint, although explaining these procedures to parents increased the perceived acceptability. There is some evidence that approaches that are generally seen as unacceptable may be perceived as acceptable if the need for dental treatment is urgent.^{12,13}

SUMMARY

A broad range of non-pharmacological approaches to the management of dentally anxious children exist. Common themes to these approaches are the importance of effective and appropriate communication, and the use of rewards contingent upon the child demonstrating the appropriate behaviour. For the best outcome a treatment package should include several interventions rather than a single intervention.¹⁴ The use of pharmacological approaches can complement behavioural management of the severely anxious child.¹⁵

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**APRIL
CPD Answers**

1. A, B, C	6. A, B, D
2. A, D	7. A, C, D
3. A, C, D	8. A, B, C
4. A, C, D	9. A, B, C
5. B, C	10. A, B, C