

Non-pharmacological behaviour management Clinical guidelines

Definition:

The means by which the dental health team effectively and efficiently performs treatment for a child. The aim is to instil a positive dental attitude. (Adapted from Wright, 1975)⁽¹⁾

1. Introduction

Wright⁽¹⁾ suggested that a "positive dental attitude" was the aim of behaviour management, subsequently he has defined the term further.⁽²⁾ It does not imply just the behaviour necessary to complete a given task, but includes creating a long-term interest on the patient's part for ongoing prevention and improved dental health in the future. To do this the dentist must establish a relationship based on trust with the child and accompanying adult to ensure compliance with preventive regimes and allow treatment to occur (the treatment alliance).⁽³⁾

Behaviour management methods are about communication and education. The relationship between the child, the child's family and the dental team is a dynamic process. It may start before the patient arrives in the surgery and can involve written information as well as dialogue, voice tone, facial expression, body language and touch. No one method will be applicable in all situations, rather the appropriate management technique(s) should be chosen based on the individual child's requirements.

Classifying children's behaviour

The label "unco-operative" is frequently applied to children who have experienced difficulty in the dental surgery, sometimes on only one occasion. The term implies that a child is deliberately difficult or obstructive, which is rarely the case. The relationship between a child and their dentist is a special one, as children do not choose to attend a dentist, their parents and carers bring them. Parents and carers may also play an important part in reducing a child's anxiety and allowing the dentist to form a treatment alliance.⁽⁴⁾

Children have relatively limited communication skills and are less able to express their fears and anxieties. Their behaviour is essentially a reflection of their inability to cope with their anxiety. When children cannot cope, they attempt to escape the impending event. The subsequent change in behaviour seen is often a manifestation of anxiety or discomfort in a child who has no other way to cope or of informing you of their difficulty. Behaviour management aims to give children appropriate coping strategies.

Children's behaviour may be characterised in three ways: Co-operative, potentially co-operative, lacking co-operative ability.⁽¹⁾ The techniques described in this guideline are appropriate for co-operative and potentially co-operative children. "Potentially co-operative" is preferred to the inaccurate "unco-operative" as described above. Children who lack co-operative ability include the very young with whom communication cannot yet be established (pre-co-operative), and children with specific disabilities with whom co-operation in the usual manner may never be achieved. These two groups are outside the scope of this guideline.

Children are not small adults, thus an understanding of child development is crucial if

behaviour management techniques are to be used effectively. The approach and language used with each child can then be modified to match their abilities and understanding.

2. Factors influencing child behaviour

Anxiety is a recognised personality trait, but there are some factors which have been found to increase the likelihood of behaviour problems at dental appointments.

** 2.1 Medical history.**

Children who have had negative experiences associated with medical treatment may be more anxious about dental treatment.⁽⁵⁻⁷⁾ Similarly, fear sustained from previous unhappy dental visits has also been related to poor behaviour at subsequent visits.^(6,8) When taking a medical history the dentist should include questions about previous hospital/medical contact/treatments and the child's response to them.

** 2.2 Parental anxiety**

A relationship between maternal anxiety and difficulties in child patient management at all ages has been shown,^(4-7,9,10) and is particularly important for children less than four years old.^(5,6) When a parent is unable to contain their own dental anxieties it may increase the child's own anxiety, in such cases finding an alternate adult who is less fearful may be helpful.⁽⁴⁾ Parents are also able to accurately predict the likely behaviour of their children.^(9,11)

** 2.3 Awareness of a dental problem.**

Children who know they have a dental problem are more likely to exhibit negative behaviour at the first dental appointment.^(5,6)

3 Communication

Good communication is essential with all patients if a good treatment alliance is to be formed. However, with children the communication pathway is more complex than the simple one to one communication that exists with most adult patients. The child, dentist, parent, carer and dental nurse are all potentially involved. However, the child can only concentrate on one individual, when problems occur it is often potentiated by unhelpful communication between the child and parent or carer. Each member of the dental team must understand their role and remit and so must the accompanying adult.

Communication with the parent is also important to establish events which have distressed the child in the past, this is especially important where a negative dental experience has already occurred.

** 3.1 The Role of the parent**

Many dentists have firm views on whether a parent should be present when dental treatment is carried out.⁽¹²⁾ However, parents also have views and many prefer to be present during treatment, especially if their child is young or at an initial visit.^(12,13)

The major concern for dentists is the potential of the parent to disrupt treatment by inappropriate communication or by exhibiting anxiety themselves (Section 2.2). The desire to exclude parents may also reflect the fact that many dentists are used to a one to one relationship with patients and find the three-way interaction threatening^(4,13) However, involving the parent in the planning stage and outlining their role as a passive

but silent helper may provide a comforting presence without unhelpful interference.⁽³⁾

Research suggests that children's behaviour is unaffected by parental presence or absence.^(3,14-17) The exception is young children (less than 4 years) who behave better with their mothers present.⁽³⁾ Separation anxiety is a normal developmental stage,⁽¹²⁾ and it has been shown to be a good indicator of dental anxiety in childhood.⁽¹⁸⁾ Thus for young children parental presence is important, for older children parental presence appears not to have such a clear effect on child behaviour but may be important to the parent. What is essential is that individual practitioners explain their practice policies on parental presence to parents.⁽¹²⁾

4. Recommendations for Behaviour management techniques

There are a number of non pharmacological techniques that aim to help manage patient behaviour. Some methods aim to improve the communication process, others are intended to eliminate inappropriate behaviour or reduce anxiety. While the techniques are described individually they are often used in combination. For example, the language used should always be age appropriate as should non-verbal communication which is happening all the time, even when we are unaware. Behaviour shaping utilises positive reinforcement and works well combined with tell-show-do for the majority of patients, the exception being those who are classified as "blunters". These patients respond best to general information but find detailed information off-putting.

It is also important to ensure that the accompanying parent knows what strategies you are likely to adopt and is prepared. If they know that you may raise your voice under certain circumstances (voice control) and why, they will react appropriately should it occur.

** 4.1 Preparatory information**

Strategies that have been used to decrease parental anxiety, such as - pre-appointment letters, may also help children.^(7,19,20) These are usually in the form of a letter welcoming the new patient and family to the practice. Such letters inform them about what will happen at the visit, give advice on preparing the child and help to reduce parental anxiety.⁽²⁰⁾

** 4.2 Non verbal communication**

This form of communication occurs continuously and may reinforce or contradict verbal signals. Such communication includes - having a child friendly environment and a happy, smiling team.⁽²⁾ Reassurance has been shown to be ineffective as a method of controlling distress. In contrast, reinforcement, that is enquiring how the child is feeling or gentle pats and squeezes has been found to minimise distress.⁽²¹⁾ These verbal cues and signs are used to give positive encouragement and enhance other management techniques and may be useful with all patients.

** 4.3 Voice control**

Young children often respond to the tone of voice rather than the actual words.⁽²⁾ Voice control techniques use a controlled alteration of voice, volume, tone or pace to influence and direct a patients behaviour. Such techniques aim to improve attention and compliance as well as to establish authority. For example, an abrupt change from soft to loud to gain attention of a child who is not complying. Voice control has been shown to

decrease disruptive behaviours without producing long-term negative effects.⁽²²⁾ However, while reported as widely used by dentists⁽²³⁾ it may not be acceptable to all parents⁽²⁴⁾ or clinicians.⁽²⁵⁾

The technique is useful for inattentive but communicative children. However, it is not appropriate for children too young to understand or with intellectual or emotional impairment.

<C> 4.4 Tell-show-do (TSD)

This technique is widely used to familiarise a patient with a new procedure.⁽²³⁾ The *tell* phase involves an age appropriate explanation of the procedure. The *show* phase is used to demonstrate the procedure, for example demonstrating with a slow handpiece on a finger. The *do* phase is initiated with a minimum delay, in this case a polish. It is important that the language used is appropriate to the child's age: many dentists use a personal version of this 'childrenese' (Table 1) and the whole dental team must adopt the same approach. Specifically emotive or negative words are avoided. It has been shown to be an effective way of reducing anticipatory anxiety in new child patients.⁽²⁶⁾

The technique is useful for all patients who can communicate. There are no contraindications.

 4.5 Enhancing control

Here the patient is given a degree of control over their dentists' behaviour through the use of a stop signal. Such signals have been shown to reduce pain during routine dental treatment⁽²⁷⁾ and during injection.⁽²⁸⁾ The stop signal, usually raising an arm, should be rehearsed and the dentist should respond quickly when it is used.⁽²⁹⁾

The technique is useful for all patients who can communicate. There are no contraindications.

 4.6 Behaviour shaping and positive reinforcement

Many dental procedures require quite complex behaviours and actions from our patients which need to be explained and learned. For children this requires small clear steps. This process is termed behaviour shaping. It consists of a defined series of steps towards ideal behaviour.⁽³⁰⁾ This is most easily achieved by selective reinforcement. Reinforcement is the strengthening of a pattern of behaviour, increasing the probability of that behaviour being displayed again in the future.⁽³¹⁾ Anything that the child finds pleasant or gratifying can act as a positive reinforcer, stickers or badges are often used at the end of a successful appointment. However, the most powerful reinforcers are social stimuli, such as, facial expression, positive voice modulation, verbal praise, approval by hugging.⁽³²⁾ A child centred, empathic response giving specific praise, for example, " I like the way you keep your mouth open" has been shown to be more effective than a general comment such as "Good girl."⁽³²⁾ As with TSD the use of age specific language is important.⁽²⁾

The technique is useful for all patients who can communicate. There are no contraindications.

 4.7 Modelling

The technique is based on the psychological principle that people learn about their

environment by observing others' behaviour, using a model, either live^(33,34) or by video^(35,36) to exhibit appropriate behaviour in the dental environment. This may demonstrate appropriate behaviour via a third party, decrease anxiety by showing a positive outcome to a procedure a child requires themselves, and illustrate the rewards for performing appropriately.⁽³⁷⁾ For best effects models should be the same age as the target child, should exhibit appropriate behaviour and be praised. They should also be shown entering and leaving the surgery.⁽³⁷⁾

The technique is useful where an appropriate model is available.

 4.8 Distraction

This approach aims to shift the patient's attention from the dental setting to some other situation, or from a potentially unpleasant procedure to some other action. Cartoons have been shown to reduce disruptive behaviours in children when combined with reinforcement, that is when children knew the cartoon would be switched off if they did not behave.⁽³⁸⁾ Later studies suggest that audio tapes may be even more effective.⁽³⁹⁾ Short term distractors such as diverting the attention by pulling the lip as a local anaesthetic is given or having patients raise their legs to stop them gagging during radiography may also be useful. The dentist who talks while applying topical paste and administering local anaesthetic is also using distraction with words.⁽²⁾

The technique is useful for all patients who can verbally communicate. There are no contraindications.

 4.9 Systematic desensitization (SD)

This technique helps individuals with specific fears or phobias overcome them by repeated contacts. A hierarchy of fear-producing stimuli is constructed, and the patient is exposed to them in an ordered manner, starting with the stimulus posing the lowest threat. In dental terms, fears are usually related to a specific procedure such as use of local anaesthetic. First, the patient is taught to relax, and in this state exposed to each of the stimuli in the hierarchy in turn, only progressing to the next when they feel able. An example of a hierarchy for local anaesthetic is shown in Table 2. For true phobias several relaxation sessions with a psychologist or dentist who has received training in relaxation or hypnosis techniques may be required.⁽²⁾ Indeed one reported case required 9 hour long sessions with a therapist.⁽⁴⁰⁾ However, a similar approach can be used for children who have had a negative experience in the past.⁽⁴¹⁾

The technique is useful for a child who can clearly identify their fear and who can verbally communicate.

<C> 4.10 Negative reinforcement

The powerful effect of positive reinforcement has been discussed already. Negative reinforcement has also been used in dental practice. It is the strengthening of a pattern of behaviour by the removal of a stimulus which the individual perceives as unpleasant (a negative reinforcer) as soon as the required behaviour is exhibited. The stimulus is applied to all actions except the required one, thus reinforcing it by removal of a negative stimulus. It should not be confused with punishment, which is the application of an unpleasant stimulus to inappropriate behaviour.

Well known examples in dental practice are Hand over mouth (HOM) and selective

exclusion of the parent (SEP).

HOM involves restraining the child in the dental chair, placing a hand over the mouth (to allow the child to hear). The nose must not be covered. The dentist then talks quietly to the child explaining that the hand will be removed as soon as crying stops. As soon as this happens the hand is removed and the child praised. If protests start again the hand is replaced. The technique aims to gain the child's attention and enable communication, reinforce good behaviour and establish that avoidance is futile.⁽⁴²⁾ Those who advocate the technique recommend it for children aged 4-9 years when communication is lost or during temper tantrums.^(41,42) Parental consent is important and the technique should never be used on children too young to understand or with intellectual or emotional impairment.⁽⁴³⁾

While still used in North America⁽⁴⁴⁾ the technique remains controversial.^(25,45) There have been no studies of the effectiveness of HOM. Its legality (with regard to restraint and individual rights) has also been questioned.⁽²⁵⁾

Selective exclusion of the parent (SEP) is less controversial but uses similar principals. The indications for SEP are the same as for HOM. Parental consent is required. When inappropriate behaviour is exhibited the parent is asked to leave. Ideally, the parent should be able to hear, but be out of sight of the child. When appropriate behaviour is exhibited the parent is asked to return, thus reinforcing that behaviour.

EXPLANATORY NOTES

2.1 Previous unpleasant dental or medical experiences may significantly affect a child's subsequent ability to accept dentistry. However, it is the emotional quality of the episode not the number of visits that is important. Children who have had positive medical experiences may be less apprehensive in the dental surgery.⁽⁶⁾ Specific questions about past medical and dental experiences and how the child coped may identify children who may be more anxious than normal.⁽⁵⁻⁷⁾ Pain experienced during medical appointments, or at least the parents beliefs about the pain experienced have been found to correlate well with their children's behaviour in a dental setting.^(5,6,9) Fear of pain may be a major concern for children.⁽⁷⁾

2.2 The importance of maternal anxiety has been recognised for over 100 years⁽⁴⁶⁾ and the relationship between maternal anxiety and child behaviour is well documented.^(5-7,11) While a definite relationship between the child's behaviour and their anxiety as assessed by the mother has been shown at all ages,⁽⁷⁾ the affect is greatest on children under 4 years.^(5,6)

Parents predictions of the likely behaviour of their children have been shown to be accurate,^(9,11) but interestingly some workers have shown them to be less accurate if their children had not previously seen a dentist.^(5,6) Typically, the child reflects their parents own perceptions, experiences and anxieties. Thus the children of anxious parents are more likely to exhibit anxiety themselves.^(6,20) In addition, parents attempts to resolve their children's anxieties may actually make the situation worse.⁽⁷⁾ In other words, strategies which help the parents to cope will also assist the child.

2.3 Children who attend the dentist for the first time and who know they have a dental problem (whatever it may be) have a tendency to poor behaviour at the first dental visit.^(5,6) Wright⁽⁷⁾ has suggested that transmission of maternal anxiety may be partially responsible. However, fear of pain is a common finding in children⁽⁴⁷⁾ and may also be a significant factor.

3.1 There are polarised views on whether a parent should be present when dental treatment occurs. Parents rightly wish to see what is happening to their children, but many dentists fear that they may disrupt the communication between the dentist and child or exhibit anxiety. Most research in this area shows no significant differences in the behaviour of children with or without their parents present.^(3,14-17) However, separation anxiety, distress when the parent is removed, is a normal developmental stage, and young children are best treated with a parent present.⁽¹²⁾ One study⁽³⁾ found that children below the age of four years behave better with their mother present, however, parental presence or absence did not seem to significantly affect the behaviour of children older than four. A clinical study using one-way mirrors found that 4 to 8 year olds exhibited more negative behaviours than 9 to 12 year olds and that parental presence made no difference.⁽¹⁴⁾ Interestingly, the same study noted that parents who observed via a one-way mirror were as satisfied as parents who were in the surgery for treatment. Although the literature suggests that parental presence does not alter behaviour, many practitioners prefer to work without parents present.⁽⁴⁸⁾ The desire to exclude parents may also reflect the fact that many dentists are used to a one to one relationship with patients and find the three-way interaction threatening.^(4,13)

4.1 Since parental anxiety is closely associated with children's behaviour, strategies that aim to decrease parental anxiety may also improve children's behaviour. Helping the parent to understand what will happen allows them to prepare the child and improves the treatment alliance.⁽⁴⁾ Preparatory information sent prior to first appointments produced improved behaviour compared to children whose parents had not received information^(19,20) and mothers also reported that the information was helpful.⁽²⁰⁾ An unexpected benefit may also be a reduction in broken appointments.⁽⁴⁹⁾

4.2 Non verbal aspects of communication impact on the emotional quality of a relationship, for example indications of friendship seem to depend more on nonverbal than verbal behaviour.⁽⁵⁰⁾ Messages are conveyed by the environment as well as by individuals. Posters depicting the effect of disease aimed at adults may frighten children.⁽³⁰⁾ The importance of non verbal messages was confirmed by an observational study of 3-5 year olds undergoing dental treatment which suggested that gentle patting of a fearful child may reduce the likelihood of such behaviour continuing, while holding and restraining are more likely to increase such behaviour.⁽²¹⁾

4.3 McKnight et al⁽²³⁾ suggested that 98% of American dentists used voice control although parents may find the technique marginally acceptable.⁽²⁴⁾ The dentists personality may also be important as some individuals will always be unhappy to raise their voices.⁽²⁵⁾ Although the technique has been shown to be effective⁽²²⁾ it has been suggested that facial expression may also be an important component.⁽⁵¹⁾

4.4 Tell-show-do is a technique using several concepts from learning theory first reported by Addelston.⁽⁵²⁾ It is widely used in children's dentistry^(23,24,41) and well accepted by parents.⁽⁵³⁾ The technique works well combined with behaviour shaping but

there is little research relating to its use. Howitt & Stricker⁽⁵⁴⁾ evaluated the approach concluding that it was useful with low anxiety levels but found no evidence to support its usefulness with very anxious children. More recently it has been shown to reduce anticipatory anxiety in new child patients, however, it was less useful in children with previous dental experience.⁽²⁶⁾

4.5 Control in this sense does not imply the possibility of avoiding the situation but rather the possibility of influencing how it is experienced. Wardle⁽²⁷⁾ interviewed two groups of patients after treatment. The first group had been given a stop signal the second had not. Only 15% of patients using the stop signal reported any pain during treatment compared with 50% of the group without the signal.

4.6 Young children may be insecure when faced with a new situation, particularly in a strange environment such as a dental surgery. They do not know how to behave or what is required of them. The dental team needs to guide the child towards a pattern of behaviour that allows dental treatment. Children wish to please you and be rewarded and repeat behaviours that are rewarded appropriately. Usually, ideal behaviours are positively reinforced or rewarded.

Reinforcers work best when applied directly after the appropriate behaviour.^(21,55) In the surgery this means continuous praise at each stage from beginning to end, not a one off "well done" as they leave you. In contrast, behaviours which are not reinforced, are less likely to occur again. Selective reinforcement of appropriate responses, and ignoring inappropriate responses, guides the child at their own pace towards the ideal. Un-rewarded responses tend to be extinguished when appropriate behaviour is immediately reinforced.⁽²¹⁾

4.7 Short, 12 minute, video presentations of treatment similar to that about to be undertaken have been shown to decrease disruptive behaviours compared to the control group.^(35,36) Videos used prior to restorative work have shown greatly reduced disruptive behaviour in 5-9 year olds with little dental experience.⁽³⁷⁾ A later study found that children viewing a film with a model reported fewer fears and showed less disruptive behaviour than children viewing films demonstrating equipment.⁽⁵⁶⁾ In other words, the model is important and should show good co-operation. The same study found best results where the models age was close to that of the observer, the child was shown entering and leaving the surgery and was praised for their behaviour.⁽⁵⁶⁾

Stokes and Kennedy⁽³⁴⁾ used live models to demonstrate behaviour to previously disruptive children. The patients arrived 15 minutes early and watched the children being praised and rewarded for good behaviour. Over 4 visits disruptive behaviour decreased by two thirds. Ghose et al⁽³³⁾ used an older sibling to model for a younger child. Interestingly the effects were positive for 4 year olds but not 3 or 5 year olds. While the benefits of modelling are demonstrated in the literature and reported in many standard texts on behaviour management, studies suggest that it is not widely used by practitioners, for example, a study of 267 Australian dentists found 85% never used modelling.⁽⁵⁷⁾

4.8 Playing tapes has been shown to help anxious adult patients,^(58,59) but its usefulness in children is not as clear.⁽⁶⁰⁾ Ingersoll et al⁽³⁸⁾ found that if cartoon tapes were played continuously during treatment disruptive behaviour was the same as in the control group

with no distractor. However, one group was told that if they were uncooperative the tape would be switched off and disruptive behaviour almost halved. This finding supports work that suggests negative reinforcement decreases disruptive behaviour.⁽²¹⁾ Work using audiotaped stories was even more effective as children closed their eyes to concentrate excluding both the sights and sounds of treatment.⁽³⁹⁾ This suggests that distractors may be effective if there is an incentive but that the type of distractor is also important.

4.9 Systematic Desensitization uses two elements, firstly gradual exposure to the fear inducing stimulus and secondly the induction of a state incompatible with anxiety. It is based on the understanding that relaxation and anxiety cannot exist at the same time in an individual.⁽⁶¹⁾ The relaxation phase is critical and may take several visits to achieve.⁽⁴⁰⁾ The best known method of relaxation is based on progressive muscle relaxation, usually starting with the feet and working up the body, coupled with slow controlled breathing.⁽⁶⁰⁾ While dentists may undertake this role, a psychologist may be preferred.⁽⁴⁷⁾

4.10 Hand over mouth (HOM) is perhaps the most controversial of all behaviour management techniques used by dentists.⁽²⁵⁾ There are individuals who believe it to be effective and kind^(43,44) and others who condemn it.⁽⁴⁵⁾ HOM is used by North American paediatric dentists⁽⁶²⁻⁶⁵⁾ although 74% of dentists in an Australian study reported the technique to be unacceptable.⁽⁵⁷⁾ One American study has also found the technique to be unacceptable to the majority of parents.⁽⁵³⁾ Concern also exists regarding the legality of HOM,⁽⁶⁵⁾ which has not been tested in Europe or North America.⁽⁴¹⁾

REFERENCES

1. Wright, G.Z. (1975) Behaviour management in dentistry for children. W.B. Saunders Company.
2. Wright, G.Z., Starkey, P.E. and Gardner, D.E. (1987) Child management in dentistry, Oxford: Wright.
3. Frankl, S.H., Shiere, F.R. and Fogels, H.R. (1962) Should the parent remain within the dental operator? J Dent Child 29: 150 - 163
4. Freeman, R. (1999) The case for mother in the surgery. Brit Dent J 186: 610-613.
5. Wright, G.Z. and Alpern, G.D. (1971) Variables influencing children's co-operative behaviour at first dental visit. J Dent Child, 23: 124-128
6. Wright, G.Z., Alpern, G.D. and Leake, (1973) J.L. A cross-validation of the variables affecting children's co-operative behaviour. J Canad Dent Assoc , 39: 268-273
7. Bailey, P.M., Talbot, M. and Taylor, P.P. (1973) A comparison of maternal anxiety and anxiety levels manifested in the child patient. J Dent Child 40: 277-284
8. McTigue, D.J. (1984) Behaviour management of children. In Spedding, R.H. Symposium on pedodontics. Dent Clin North Am 28: 81-93
9. Johnson, R. and Baldwin, D.C.Jr (1969) Maternal anxiety and child behaviour. J Dent Child 36: 87-92
10. Corkey, B. and Freeman, R. (1994) Predictors of dental anxiety in 6 year-old children- a report of a pilot study. ASCD J Dent 61: 267-271.
11. Johnson, R. and Baldwin, D.C.Jr (1968) Relationship of maternal anxiety to the behaviour of young children undergoing dental extraction. J Dent Res 47: 801-805
12. Guthrie, A. (1997) Separation anxiety: an overview. Ped Dent 19:486-490.
13. Kamp, A.A. (1992) Parent child separation during dental care: a survey of parent's

- preference. *Ped Dent* 14: 231-235.
14. Fenlon, W.L., Dobbs, A.R. and Curzon, M.E.J. (1993) Parental presence during treatment of the child patient: a study with British patients. *Brit Dent J* 174: 23-28.
 15. Lewis, T.P. and Law, D.B. (1958) Investigation of certain autonomic responses of children to a specific dental stress *J Am Dent Assoc* 57: 769-777
 16. Allen, B.P. and Evans, R.I. (1968) Video tape recordings in social psychological research: an illustrative study in pedodontia. *Psych Rep* 23: 1115-1119.
 17. Venham, L.L., Bengston, D. and Ciphes, M.I. (1977) Children's response to sequential dental visits. *J Dent Res* 56: 454-459.
 18. Holst, A., Hallonsten, A.-L., Schroder, U., Ek, L. and Eklund, K. (1993) Prediction of behaviour-management in 3-year-old children. *Scand J Dent Res* 101: 110-114.
 19. Rosengarten, M. (1961) The behaviour of the pre-school child at the initial dental visit. *J Dent Res* 40: 673.
 20. Wright, G.Z., Alpern, G.D. and Leake, (1973) The modifiability of maternal anxiety as it relates to children's co-operative dental behaviour. *J Dent Child* 40: 265-271.
 21. Weinstein, P., Getz, T., Ratener, P. et al (1982). The effect of dentists' behaviours on fear-related behaviours of children. *J Am Dent Assoc* 104: 32-38.
 22. Greenbaum, P.E., Turner, C. and Cook, 3rd. E.W. et al (1990) Dentists' voice control: effects on children's disruptive behaviour. *Health Psychol* 9: 546- 558.
 23. McKnight-Hanes, C., Myers, D.R., Dushku, J.C. et al (1993) The use of behaviour management techniques by dentists across practitioner type, age, and geographic region. *Pediatr Dent* 15: 267-271.
 24. Murphy, M.G., Fields, H.W. and Machen, J.B. (1984) Parental acceptance of pediatric dental behaviour management techniques. *Pediatr Dent* 6: 193-198.
 25. Roberts, J. F. (1995) How important are techniques? The empathic approach to working with children. *J Dent Child* 62: 38-43.
 26. Carson, P. and Freeman, R. (1998) Tell-show-do: reducing anticipatory anxiety in emergency paediatric dental patients. *Int J Health Prom & Educ* 36: 87-90.
 27. Wardle, J. (1982) Management of dental pain. Paper presented at the British Psychological Society Annual Conference, York, 1982.
 28. Thrash, W.J., Marr, J.N., Boone, S.E. (1982) Continuous self-monitoring of discomfort in the dental chair and feedback to the dentist. *J Behav Assess* 4: 273-284.
 29. Thrash, W.J., Marr, J.N., Box, T.G. (1982) Effects of continuous patient information in the dental environment. *J Dent Res* 61: 1063-1065.
 30. Lencher, V. and Wright, G.Z. (1975) Nonpharmacotherapeutic approaches to behaviour management. In: Wright, G.Z., (Ed) *Behaviour management in dentistry for children*. Philadelphia, Saunders.
 31. Satwell, R., Simon, J.F. and Simeonsson, R. (1974) The effects of five preparatory methods upon children behaviour during the first dental visit. *J Dent Child* 41: 367-375.
 32. Weinstein, P. and Nathan, J. (1988) The challenge of fearful and phobic children. In: *Dental phobias and anxiety*. *Den Clin N Amer*.
 33. Ghose, L., Giddon, D., Shiere, F. et al (1969) Evaluation of sibling support. *J Dent Child* 36: 35-49.
 34. Stokes, T.F. and Kennedy, S.H. (1980) Reducing child unco-operative behaviour during dental treatment through modelling and reinforcement. *J Appl Behav Anal* 13: 41-49.
 35. Johnson, R. and Machen, J.B. (1973) Behaviour modification techniques and maternal

- anxiety. *J Dent Child* 40: 272-276.
36. Machen, J.B. and Johnson, R (1974) Desensitization, model learning, and the dental behaviour of children, *J Dent Res* 53: 83
 37. Melamed, B.G., Weinstein, D., Hawes, R. et al (1975) Reduction of fear-related dental management problems with use of filmed modelling, *J Am Dent Assoc* 90: 822-826.
 38. Ingersoll, B.D., Nash, D., Blount, R. and Gamber, C. (1984) Distraction and contingent reinforcement with pediatric dental patients. *J Dent Child* 51: 203-207.
 39. Ingersoll, B.D., Nash, D. and Gamber, C. (1984) The use of contingent audiotaped material with pediatric dental patients. *J Am Dent Assoc* 109: 717-719.
 40. Gale, E.H. and Ayer, W.A. (1969) Treatment of dental phobias. *J Am Dent Assoc* 8:130-134.
 41. Fayle, S. and Crawford, P.J.M. (1997) Making dental treatment acceptable to children. *Dental Profile* September: 18-22.
 42. American Academy of Paediatric Dentistry (1998) Guidelines for behaviour management. *Pediatr Dent* 20: 27-32. (Special Issue).
 43. Levitas, T.C. (1974) HOME – hand over mouth exercise.. *J Dent Child* 41: 178-182.
 44. Barton, D.H., Hatcher, C., Porter, R. et al (1993) Dental attitudes and memories: a study of the effects of hand over mouth/restraint. *Ped Dent* 15: 13-19.
 45. Andlaw, R.J. and Rock, W.P. (1982) A manual of paedodontics. 2nd edition Edinburgh, Churchill Livingston.
 46. Steen, W.M. (1891) Our relation to children. *Dent Rev* 5: 534-537.
 47. Huq, A.H., Lindsay, S.J.E., Roberts, J.F. (1992) Children's expectations and recollections of discomfort associated with dental treatment. *Int J Paed Dent* 2: 11-16.
 48. Glasrud, P.H. (1984) Dentists' characteristics and child behaviour management techniques. *J Child Dent* 51: 337-348.
 49. Hawley, B.P., McCorkle, A.D., Witteman, J.K. et al (1974) The first dental visit for children from low socio-economic families. *J Dent Child* 41: 376-381.
 50. Argyle, M. (1969) Social interaction. London, Methuen.
 51. Pinkham, J.R. and Paterson, J.R. (1985) Voice control: an old technique re-examined. *J Dent Child* 52: 199-202.
 52. Addleston, H.K. (1959) Child patient training. *Fortnightly Rev Chicago Dental Soc* 38: 7-9, 27-29.
 53. Fields, H.W.Jr, Machen, J.B. and Murphy, M.G. (1984) Acceptability of various management techniques relative to types of dental treatment. *Ped Dent* 6: 199-203.
 54. Howitt, J.W. and Stricker, G. (1965) Child patient responses to various dental procedures. *J Amer Dent Assoc* 70: 71-74.
 55. Rosenberg, H.M. (1974) Behaviour modification for the child patient. *J Dent Child* 41: 111-114.
 56. Melamed, B.G., Yurcheson, R., Fleece, E.L. et al (1978) Effects of film modelling on the reduction of anxiety related behaviour in individuals varying in level of previous experience in the stress situation. *J Consult Clin Psych* 46: 1357-67.
 57. Wright, F.A.C., McMurray, N.E. and Giebartowski, J. (1991) Strategies used by dentists in Victoria, Australia to manage children with anxiety or behaviour problems. *J Dent Child* 58: 223-228.
 58. Corah, N.L., Gale, E.H. and Illig, S.J. (1979) Psychological stress during dental procedures. *J Dent Res* 58: 1347-1351.
 59. Corah, N.L., Gale, E.H. and Illig, S.J. (1979) The use of relaxation and distraction to reduce psychological stress during dental procedures. *J Am Dent Assoc* 98: 390-

- 394.
60. Kent, G.C. and Blinkhorn, A.S. (1991) *The psychology of dental care*. 2nd Ed. Wright 1991.
 61. Wolpe, J. (1969) *The practice of behaviour therapy*. New York, Pergamon Press.
 62. Levy, L.L. and Domoto, P.K. (1979) Current techniques for behaviour management: a survey. *Ped Dent* 1: 160-164.
 63. Association of Pedodontic Diplomats (1972) Techniques for behaviour management - a survey. *J Dent Child* 39: 368-372.
 64. Davis, M.J. and Rombom, H.M. (1979) Survey of the utilization of and rationale for Hand-Over-Mouth and restraint in post-doctoral pedodontic education. *Ped Dent* 1: 87-90.
 65. Cassamassino, P. (1993) Editorial: Maybe the last editorial on hand-over-mouth technique?. *Ped Dent* 15:233-234.
 66. Levitt, J., McGoldrick, P. and Evans, D (in press) The management of severe dental phobia in an Adolescent: A case report.

Table 1**"Childrenese" terms for dental equipment:**

buzzy bee	slow handpiece.
whizzy brush or Mr whistle	airotor.
magic wind	triplespray/inhalation sedation.
jungle juice or sleepy juice	local anaesthetic.
spray your teeth off to sleep	giving a local anaesthetic.
rubber raincoat	rubber dam.
clip or button	rubber dam clamp.
tooth paint	fissure sealant
hoover	suction
silver star	amalgam

Based on Fayle et al 1997⁽⁴¹⁾

Table 2**Systematic desensitisation hierarchy for phobia related to dental local analgesic injections.**

1. Instructions on muscle relaxation and or relaxation breathing
2. Explanation of components of local anaesthetic equipment
3. Look at an assembled dental syringe
4. Explanation and demonstration of effect of topical anaesthetic
5. Information and facts about local anaesthetic administration
6. Hold an assembled dental syringe on the palm of the patient's hand
7. Hold an assembled dental syringe by the patient's face
8. Hold an assembled dental syringe inside the patient's mouth
9. Hold an assembled dental syringe (needle guard removed) on the palm of the hand
10. Hold a syringe (guard removed) by the side of the face
11. Hold the syringe inside the mouth (guard removed)
12. Replace the guard and hold the end of the syringe against the mucosa overlying the injection site
13. Press the syringe (guard in place) over the injection site
14. Place topical anaesthetic
15. Remove the guard and hold the syringe inside the mouth
16. Place the needle in contact with the mucosa over the injection site.
17. Place the needle in contact with the mucosa and insert some pressure
18. Hold the needle in contact with the mucosa and inserting enough pressure for the needle to penetrate the mucosa
19. As in 14, but deliver a minute amount of local analgesic solution
20. As in 14 but deliver a normal amount of local analgesic solution

Adapted from Fayle et al 1997⁽⁴¹⁾ and Levitt et al 2000⁽⁶⁶⁾