# Treatment of Dental Fears: Pharmacology or Psychology?

F.B. Naini, A.C. Mellor and T. Getz

*Abstract:* Fear of dental treatment constitutes one of the major obstacles to receiving dental treatment, in both the UK and the USA. Treatment for such fear can be pharmacological or psychological, or a combination of both. In this article the aetiology diagnosis and treatment of dental fear will be described and the treatment methods compared.

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*Clinical Relevance:* Fear of treatment is still the main reason for non-attendance at the dentist; thus all general dental practitioners need to be aware of these problems and know how to deal with them.

Dental fear is common.[1,2] In the UK Adult Dental Health Survey of 1988, 45% of dentate adults stated that fear was the most important barrier to dental care,[3] and this percentage increased among patients of lower socio-economic groups and irregular attenders.

A telephone survey of 1000 Seattle adults[4] showed that 50% of the population have some fear of dental treatment; 20% to such an extent that it interferes with their ability to receive adequate treatment; and 3% are 'terrified'. Women were almost twice as likely to report fear as men, but the researchers believe that this may just be because they are more likely to *admit* fear. The three most feared dental procedures are:

- drilling,
- injections and
- cleaning,

***F.B. Naini,*** *BDS, FDS, Specialist Registrar in Orthodontics, Royal London Hospital,* ***A.C. Mellor,*** *PhD, FDS, Senior Lecturer, Unit of Primary Dental Care, University Dental Hospital of Manchester, and* ***T. Getz,*** *MS, Psychologist, Dental Fears Research Clinic, University of Washington School of Dentistry, Seattle, Washington, USA.*

in that order. Almost two-thirds of the fearful acquired their fear before or while they were at school, but 17% acquired it in their late teenage years or as adults. Dental fear is also not a temporary thing; it stays with the individual.[5]

Although many people feel a little anxious about going to the dentist, those who are phobic are seized by a fear that goes beyond the rational. These people cannot control their fear enough to see a general dental practitioner and will often endure severe pain rather than attend for treatment.

Anticipation of pain during treatment is the main reason for fear. Dental procedures often involve some discomfort, but phobics become so distraught that the pain is much worse than it otherwise would be. Because the dentally phobic patient is anticipating pain, their body begins secreting adrenaline. As adrenaline acts as a neurotransmitter it makes the transmission of pain impulses easier.[6] Therefore the patient reacts excessively to what the dentist may feel is a mild pain stimulus, but which to the patient is very real pain.

However, some of the extra pain that phobics feel may be caused by dentists. One person in every seven is not adequately anaesthetized, a finding based on respondents' reports that they were hurt during procedures that should not have been painful, such as having teeth filled.[6] Both fearful and non-fearful patients report this, although the rate is higher in fearful patients.

In addition to not giving enough anaesthetic, dentists may cause unwarranted pain by injecting the anaesthetic too quickly, which hurts more.[6] Some people do not go numb when an anaesthetic is given in the usual way; their anatomy may be unusual and require different techniques. The way that some dentists test whether a patient is numb enough is to commence drilling:[6] however, it is possible to find out that a patient is not adequately anaesthetized by testing their reactions to mildly uncomfortable stimuli, then gradually escalating the discomfort. Responses can be tested using cold or heat and then electric impulse, before starting drilling.

Other patients are absolutely terrified of injections. A needle-phobic patient who had avoided the dentist for 15 years explains:

> *Just the thought of that breaking the skin, puncturing it like a nail going in a rubber tyre.*

Although it is important, fear of pain is not the only cause of dental fear.[7] Another common fear is loss of control. One patient whose main fear was of the rubber dam explained:

> *I feel trapped; they put all these things in your mouth, and I am afraid I will not be able to get them out.*

Some patients cannot pinpoint their

fears. To them, it is simply the whole experience which is unnerving. Others are unnerved by the thought of being criticized and made to feel guilty by the dentist for not taking care of their teeth.

## DIAGNOSIS OF DENTAL ANXIETY

It is important to realize that patients' fears of dentistry differ. Hence, the methods used for successful treatment must be tailored to the particular type of patient and may involve the entire dental team. Each member has a role in treating the fearful patient: the receptionist can ask the patient on the phone about their previous dental experiences, and reassure the patient that the dentist is especially skilled in treating fearful patients; the dental nurse helps the patient with proper breathing and distracts some patients with non-dental conversation. The dental team relies upon behavioural techniques adapted from psychology, which can readily be applied by dental personnel. In situations where this approach has been used it has been shown that patients' fear levels dropped dramatically and post-treatment measures of trust were very high.[4]

Both qualitative and quantitative measures can be used to identify and distinguish the anxious patient from the phobic patient. Qualitative measures are obtained from observation and careful history taking. The patient may appear nervous and there may be signs of shaking, sweating or even crying. Some nervous patients will talk incessantly; others avoid eye contact. The dental history is most important. The date of the last dental treatment, the reason for the last visit, personal bad experiences or any in the family can give valuable insight into patient attitudes.

Quantitative measures of fear are usually questionnaires, which the patient completes before seeing the dentist. Probably the most well known scale is the Dental Anxiety Scale.[8] This consists of four questions about different dental situations. Each question is scored from 1 (not at all anxious) to 5 (extremely anxious) so the range of scores for the whole scale is 4 to 20. The average score is about 8, with scores between 13 and 16 indicating profound anxiety and 17 or above indicating dental phobia. The Dental Anxiety Scale has recently been modified to include a question about fear of injections.[9]

Other scales that can be used include the Dental Fear Survey,[10] the State-Trait Anxiety Inventory[11] and the Structured Interview for Assessing Dental Fear[12]

Using this diagnostic schema, which is based upon a cognitive and behaviouralistic model for mental functioning rather than a psychodynamic approach,[13] four types of anxious patients can be identified. These are discussed below.

### Patients Who Fear Specific Stimuli

Patients who fall into this category are those who have no other worries or concerns about dentistry apart from fear of one specific stimulus, such as the drill, the injection, or the rubber dam.

### Patients With Generalized or Free-Floating Anxiety

These patients have more than one fear, with dentistry being just one of many situations they perceive as stressful. Their fear of dentistry is usually not a result of a particular trauma, but is due to their feelings of inadequacy and their poor coping skills.

### Distrustful Patients

These patients generally complain that they feel belittled by dentists or that their dentists were always in a hurry. When a dentist is confronted by a new patient who shows anger, the dentist can feel this to be inappropriate and irrational behaviour and may find it difficult not to respond.

### Patients With Fear of Physical Catastrophe

These patients often have a history of 'attacks' in various situations. They may also fear fainting, choking, gagging or an inability to breathe. They may believe that they are allergic to local anaesthetic. The fear usually centres on a specific procedure. Rather than being afraid of dentistry, such patients usually state that they fear their own 'involuntary' physical reactions.

## TREATMENT OPTIONS FOR ANXIOUS PATIENTS

There are general techniques that may be effective for some or all patients.

### Relaxation Techniques

*Breathing*

Breathing plays an important role in relaxation, and a relaxed patient does not feel discomfort as much as one who is tense. Patients are told to hold their breath in deeply to a count of five, and then sigh and exhale slowly to a count of five. The muscles naturally relax on exhalation. The dental nurse can help the patient pace their breathing during dental procedures.

*Distraction*

The patient should be taught to focus their attention on something other than the procedure being carried out. Music is one of the most easily used techniques. Talking to the patient about a favourite non-dental topic is also useful. Distraction, however, works best only for short time periods.

*Progressive Muscle Relaxation*

This works on the principle that, after complete contraction, muscles relax more than usual. Hence, the patient is instructed to tense certain muscle groups for five seconds, followed by 20 seconds of relaxation. The patient can be encouraged to practise this technique at home.

### Control Strategies

*Signalling*

Signalling is very effective for patients who feel that they will be unable to control what the dentist is doing.[14]

Patients should be given a stop signal (such as raising the left hand); an even more effective strategy is to encourage patients to signal when they are ready to proceed. It is important for the dentist to stop when a patient signals to interrupt treatment, and not to show impatience. The dentist must also remember to praise the patient when a signal is given to proceed with treatment.

### *Rehearsal Sessions*

These provide an opportunity to experience a dental procedure before its clinical use (e.g. a local anaesthetic injection). During the injection rehearsal (shown in Figure 1) the purpose of the topical anaesthetic is first explained to the patient, then some topical anaesthetic is placed on the patient's tongue so that the full sensation of numbness is obtained. Topical anaesthetic is then placed on the gingivae at the injection site and left for 90 seconds. The patient is allowed to test the area with a blunt instrument to feel the difference. The syringe is then placed in the mouth with the cap on for 30 to 40 seconds. Most patients now become very tense, hold their breath and tighten their muscles—prompting him or her to acknowledge the power of the mind to create physiological upset. The patient is now ready to learn simple exercises to help control the fear and physiological imbalance.

The objectives of the injection rehearsal are:

- to explain the principles behind the use of topical anaesthetic;
- to explain the principles involved in giving 'painless' injections;
- to take the patient through a needle desensitization hierarchy;
- to integrate breathing and muscle relaxation skills with needle desensitization.

***Figure 1.*** *The injection rehearsal. Mr Tracy Getz, a clinical psychologist, is going through an injection rehearsal with one of the authors (F.B.N.) acting as a needle-phobic patient. Scenes such as this can be videotaped and played to fearful patients before the injection rehearsal.*

It is important to the patient that the topical anaesthetic is used to dull the sensation of the needle going through the skin. It does not remove every sensation, but it does make it much more comfortable.

One reason why injections can hurt is that the solution is injected too quickly. The tissues are stretched and this causes pain. That is why injections should be given slowly, and why it is important for the patient to relax.

A lot of people wonder why the syringe is so large and the needle so long. The syringe's size allows the dentist to make it very stable while giving slow injections. The needle is long so that placement is accurate. It does not go all the way in!

## Reduction of General Anxiety

### *Positive Reinforcement*

Positive reinforcement is very important to help the patient feel that he or she has achieved something—for example, a patient afraid of the rubber dam can have a rehearsal on a single anterior tooth. Any progress should be praised. Detailed information is not very important for this type of patient.

### *Hypnosis*

Patients with generalized anxiety are usually very receptive to suggestion, and hypnosis may therefore be helpful.

### *Appointments*

Appointment keeping is very important for anxious patients. Many patients will feel the urge to cancel appointments due to anticipatory anxiety. This anxiety can be lessened by telling the patient what is going to happen at their next appointment. It can also be useful for a member of the dental team to contact the patient a day or two before the appointment to check how he or she is feeling and to give reassurance. This caring attitude will help to gain further trust (Figure 2).

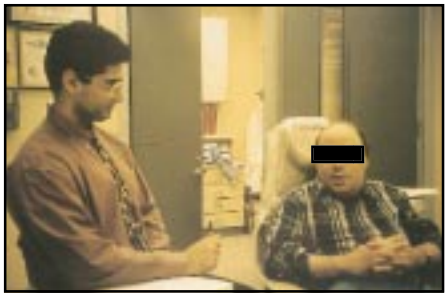

***Figure 2.*** *After psychological therapy, this patient now successfully undergoes dental treatment at the University of Washington Dental School. He remembers being held and tied down as a child, while a dentist sat on his chest to extract some teeth. This case is obviously very extreme, but the majority of dental fears do begin in childhood. The patient now sings out loud while having dental treatment and the staff have accepted this as his method of 'self-distraction'.*

## Psychological Treatment

### *Systematic Desensitization*

This technique involves substituting a relaxation response for an anxiety response.[15-17] First, a hierarchy of fear-producing situations specific for the patient's particular fear is constructed. The patient is taught relaxation techniques, and then asked to visualize a scene from the low fear end of the hierarchy. While maintaining a relaxed state, the patient systematically progresses in imagination through all items in the hierarchy. The patient should not be exposed to a step in the hierarchy until he or she has shown the ability to cope with the previous step.

### *Biofeedback*

Biofeedback is a method by which patients can learn to control their physiological functions and thereby alter their physiological state. A variety of biofeedback procedures have been used to manage dental fear,[18-20] such as a simple heart rate monitor which clips onto the patient's earlobe or finger. Patients can be considerably reassured when able to self-monitor their own

physiology. A patient may feel that their heart is racing, but if the monitor shows only 75 beats/min, they will relax. In addition, patients can obtain feedback by looking at the monitor while trying to relax themselves, providing an additional distraction.

### Pharmacological Treatment

#### *Inhalation Sedation*

Inhalation sedation uses a nitrous oxide/oxygen mixture with the nitrous oxide level titrated to the individual patient's needs to give a level of sedation by which the patient can be given intra-oral local anaesthesia.[21,22]

#### *Intravenous Sedation*

Intravenous sedation is achieved by injecting midazolam through a cannula inserted in the dorsum of the hand or the antecubital fossa. The dose is titrated to the individual needs of the patient and local anaesthesia is then administered.[23]

#### *General Anaesthesia*

Some patients are unable or unwilling to receive treatment under sedation and therefore general anaesthesia is the next option. It is not a long-term solution as repeated general anaesthetics have significantly higher morbidity and increased treatment costs. However, general anaesthesia is useful for pain relief for a severely anxious patient who presents with an immediate treatment need. Other therapies can be instituted once the patient is more comfortable.

## TREATMENT OF SPECIFIC PATIENT CATEGORIES

### Patients Who Fear Specific Stimuli

The most effective treatment appears to be gradual patient-controlled exposure to the feared stimulus.[1] The aim is to allow the patient to feel more in control of the frightening situation: the 'Tell-Show-Do' approach (often used with children) is an excellent example of graduated exposure.

The patient should first be told what they can expect to feel during a procedure—for example, vibration with the slow-speed drill. They should also be given an idea of how long a procedure will last.

Second, it should be explained to the patient that he or she has some control over their pain and discomfort, that anxiety increases sensitivity to pain, and so he or she actually feels more pain when upset. The dentist must explain that it is up to the patient to control his or her emotions, whilst the dentist will try to minimize the actual sensations. Preparing for a painful experience contributes to the pain. Patients should be taught to substitute a coping behaviour that reduces arousal and focuses the patient's cognitions away from the expectation of pain. Information about any procedure should be given in concise lay terms.

The patient can be made to feel more in control of the situation by the use of signalling and rehearsal sessions.[1]

### Patients With Generalized Anxiety

The key to helping these patients is to help them cope actively with stress. Shannon and Isbel[24] have shown that expectation of harm produces an emotional response as extreme as that produced by actual procedures. The dentist must help the patient to identify positive coping strategies that he or she can apply to reduce the anxiety associated with dental procedures.

### The Distrustful Patient

Understanding that fears may often be the source of this behaviour is helpful in working with this type of patient. These patients require an increased sense of control. The dentist must show interest in what the patient has to say. Information is a priority. The patient should be given a written treatment plan and extra time should be set aside for discussion. Most importantly, the dentist must allow the patient to decide what to do, and not try to convince the patient that any one treatment is best.

These are the patients who will experience treatment when the local anaesthetic has not worked and not tell the dentist; then at the end of the appointment they will say how horrible it was! It is thus important that two-way communication is encouraged.

Correcting a minor aesthetic problem may win over this type of patient, making them more likely to return. At the end of treatment it is important to ask the patient for feedback, for example by asking "What could we do next time to make it easier for you?"

Finally, a calm, detached, professional manner is most effective with these patients.

### Patients Fearful of Physical Catastrophe

When treating patients who fear a physical catastrophe, it is very important not to deny their past experiences, as to them they were very real events. Treatment usually begins with rehearsal of the feared procedure—such as an injection being duplicated in every detail except for actually injecting anaesthetic. Such a rehearsal is usually sufficient to trigger a partial reaction. By recreating the patient's symptoms without performing the actual treatment it is possible to demonstrate the mind/body connection to the patient—and it can be explained that thoughts cause the release of hormones which include a wide range of upsetting, but not dangerous, physiological reactions. Hence a psychophysical aetiology is explained. Once the patient recognizes the role of his or her physiological response to dental treatment, either systematic desensitization or biofeedback can be used.

## DISCUSSION

In comparing the psychological and pharmacological approaches, it is clear that neither is better than the other because the reality of modern dental practice must be taken into account. Sedation allows the almost immediate treatment of fearful patients whereas psychology can take many hours; however, with effective psychological therapy, patients can later be treated as

***Figure 3.*** *One of the staff members in the Sedation Clinic at Guy's Hospital is treating a dental-phobic patient. In addition to nitrous oxide and intravenous sedation, some patients are treated using TLC (Tender Loving Care) and no sedative drugs are used. TLC patients simply require a little more time and care on the part of the dentist. At Guy's, some of the dental nurses are trained as specialist nurses in dental sedation. The role of dental nurses is vital in the treatment of sedation patients.*

regular dental patients, whereas patients initially undergoing sedation will still require sedation for dental treatment.

The need for sedation cannot be understated. A large number of patients, especially those in the UK, are unwilling to have 'psychological help' to overcome their dental fears (Figure 3). This is because the use of psychology to treat 'normal' patients is still largely unaccepted in the UK, although it is regularly accepted in the USA.

One of the most important points raised by dental phobia is being able to trust a dentist. Trust is built by confidence, seeing the same faces at each stage of the treatment. General dental practice can provide that atmosphere; the same dentist provides all stages of treatment, and patients build a relationship with the nursing and reception staff.

Many sedation drugs have amnesic properties, and patients therefore tend not to remember the treatment carried out. Fearful patients not only find it difficult to tolerate treatment but also pose significant problems to the dentist attempting to provide that treatment; this is one of the main sources of stress to dentists. Sedation can provide an immediate answer to this problem, but successful psychological therapy can provide longer lasting benefits, both for the patient and the dentist.

It is questionable whether a general dental practitioner could successfully treat patients with a severe phobia, without the use of either sedation or psychological expertise: for patients with a severe phobia either sedation or the help of a psychologist are therefore required. However, with training and interest, a dentist can often relieve symptoms of moderate dental fear. Techniques such as those outlined:

- explanation and information;
- tailoring the pace to the patient's needs;
- giving the patient some control ('perceived control' – the patient must believe that they have some control in their treatment); and
- being empathetic, relaxed and positive;

can do much to reduce the patient's fears when applied systematically.

Given the number of patients reporting slight and moderate dental fear, the modern dentist would be well advised to use fear-reduction techniques and to reserve sedation for the severely phobic.

## CONCLUSIONS

The treatment of anxious patients can be stressful and time-consuming but may be very rewarding. We have tried to describe how the use of psychological and pharmacological methods can complement each other to rehabilitate such patients. With fear of treatment still being the main reason for non-attendance at the dentist, all general dental practitioners need to be aware of these problems.

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