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Stress Reduction for the Oral Health Care Patient at High Risk for Medical Emergency

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Overview

Many patients present a high risk for medical emergency during oral health care treatment, and some of these patients may not be able to manage even common stresses created by such treatment. This article suggests a stress reduction protocol that can be incorporated for these patients. This program, which begins and ends with stress reduction protocols and various means of pain control, can help prevent medical emergencies in the oral health care setting, as well as improve the posttreatment healing of patients at risk (Table I).[1]

Introduction

After taking a thorough medical and oral health history and performing a modified physical assessment of the patient, the oral health care provider should determine if the patient presents any medical risks for the treatment planned. The physical classification system from the American Society of Anesthesiologists (ASA) makes this determination simpler (see sidebar, page 29, top).[2]

Within this physical classification system, ASA I patients ("green flag") are considered to be normal and healthy and have little or no anxiety. ASA II patients ("yellow flag") have mild to moderate systemic disease, or they are healthy but demonstrate a more extreme anxiety and fear toward dentistry than ASA I patients. ASA III patients ("yellow flag") have severe systemic disease that limits activity but is not incapacitating, or they have mild to moderate systemic disease with more extreme anxiety and fear toward dentistry.

ASA IV patients ("red flag") have severe systemic disease that limits activity and is life threatening. For these patients, the potential health risks presented by their severe medical problems are more significant than the potential dangers associated with oral health care treatment. Whenever possible, elective oral health care should be postponed for patients in ASA category IV until their medical condition has improved to at least an ASA III classification. Note that stress can change the classification of a relatively healthy person (ASA I) to a higher level (ASA II), or that of one with mild to moderate disease (ASA II) to an even higher level (ASA III).

It is the oral health care provider's responsibility to determine if a patient has the emotional and physical ability to comfortably and safely cope with the planned treatment.[3] Acute anxiety recognition "can be determined by ... communicating with the patient and by observing physical signs and symptoms" (see sidebar, page 29, bottom).[4] This determination enables reduction of any physical and emotional discomfort and also helps identify any medical complications that may lead to a medical emergency during oral health care treatment.

Noted author Stanley Malamed, DDS, professor of anesthesia and medicine, University of Southern California School of Dentistry, Los Angeles, California, presents seminars on medical emergencies in the dental office and has promoted the

Table I. Stress reduction for the oral health care patient at high risk for a medical emergency*

Pretreatment protocol	Physical classification (ASA) and acute anxiety recognition	Proper rest and diet with transportation obtained	Initial consulting appointment, prescription for preoperative medication considered	Short morning treatment appointments, early in week
Pain control	Vocal sedation, relaxation techniques	Amenities such as music, aromatherapy, and massage	Hypnosis and acupuncture	Nitrous oxide inhalation and local anesthetic use
Posttreatment protocol	Referral if needed	Written recommendations	Medications: OTC and prescription	Follow-up telephone call

*See text for explanations for acronyms used in this table

concept of ASA in his courses. He says states during his seminars that it is just as important to know when *not* to treat patients as it is to know when to treat them, and that the risk of treatment must not outweigh the benefits. He also points out that 75% of medical emergencies in the dental offices are related to stress and anxiety and thus are preventable.[5]

Part of the prevention of office medical emergencies with patients at high risk requires modification of treatment procedures, and the specific modifications will vary according to the type of risk. However, it is almost universally the case when working with a patient at high risk for a medical emergency that stress must be reduced before, during, and after the oral health care treatment. The American Dental Association (ADA) strongly recommends stress reduction techniques in the oral health care setting, especially for patients with anxiety problems or known heart disease. It was noted in a recent study in the *Journal of the American Dental Association* that patients with severe heart disease whose blood pressure fails to adapt well to stress are at high risk of experiencing heart failure during oral health care procedures.[6]

American Society of Anesthesiologists Physical Classification System

ASA I	**A normal healthy patient**
ASA II	**A patient with mild systemic disease**
ASA III	**A patient with severe systemic disease**
ASA IV	**A patient with severe systemic disease that is a constant threat to life**

Signs and Symptoms of Acute Anxiety

Cold, sweaty palms or forehead
Flushing of face
Altered facial expression such as bulging eyebrows
Dry mouth or increase in salivation
Bruxism or clenching of teeth
Increased need to urinate
Unnaturally stiff posture
Inability to sit still
Trembling or tremors
Fiddling with items in his or her hands
"White-knuckle" syndrome
Tapping feet or fingers
Crying out or moaning
Hyperventilation, syncope, nausea, or vomiting
Increased respiration, blood pressure, and heart rate

Source: Nunn P: Medical emergencies in the oral health care setting. **Journal of Dental Hygiene *2000;74(II):136-151.***

Discussion

Oral health care treatment can and does cause stress in patients, and each patient varies in his or her ability to emotionally and physically manage stress. Patients at high risk for a medical emergency may not be able to deal with the same amount of stress that healthy patients may manage easily. It is important to remember not only to take into account the patient's medical condition when evaluating the ability to manage stress, but also to consider behavior problems related to the medical condition and any psychological therapy the patient may be receiving, such as grief or depression counseling.

In light of oral health care treatment, the stress reduction protocol is based on common sense and a caring attitude toward the patient. It assumes that oral health care professionals are treating people and not just their periodontium. It is a protocol that should be understood and followed by the entire staff. The special role of the dental hygienist may be to provide information and coordinate efforts in this area. Speaking at the 2003 ADA annual session, Risa Simon, a certified management consultant, called it "making a comfort zone" for patients. The consumer media have coined the term "dental spa," but many practices offer services and amenities specifically designed to relax patients without considering themselves a "spa."

Henrietta Logan, PhD, professor in the College of Dentistry at the University of Iowa in Iowa City, has found that the more stress patients feel prior to oral surgery, the more postsurgery complications they experience.[7] Logan asked potential oral surgery patients to rate their own stress levels prior to extraction of their third molars. Patients with the most stress had twice as many postsurgery complications, such as infection, as those who reported low stress levels, no matter how difficult the surgery.

Logan recommends that oral health care providers be aware of the behavior-health relationship and incorporate stress reduction prior to treatment. Her studies analyzed salivary levels of cortisol before, during, and after the treatment to measure stress. Possibly a similar tool will be developed for use in oral health care settings in the future.

Pretreatment Stress Reduction Protocol

The first step in stress reduction is to prepare the patient emotionally and physically for the treatment planned. It is the patient's responsibility to get proper rest the night before treatment and to follow any dietary instructions provided, such as the health care provider may advise reduction or elimination of caffeine. Most importantly, the patient must have taken their regularly prescribed medication. Also, if the patient will need transportation home following treatment, these arrangements should be made beforehand.

The patient should be scheduled for treatment in the morning, so as not to undo a good night's rest by going in to

work or performing other activities. Also, functional reserve is generally highest in the morning hours. The appointment should be early in the week to allow for follow-up emergency treatment when the patient's physician and oral health care provider are readily available.

Thought must also be given to the duration of the appointment. A shorter appointment may be less challenging to a patient's limits of emotional and physical tolerance. Avoidance of elective treatment during unusually hot and humid weather may be advisable, as such a patient may need a larger-than-normal cardiac output to meet normal regulatory demands.

The dental hygienist may want to schedule an initial consulting appointment with the patient and the supervising dentist before treatment begins. During this appointment, the full treatment plan can be discussed thoroughly with the patient, and the role of the oral health care staff made clear; knowing what is going to be done reduces the patient's emotional stress.[8] The supervising dentist may suggest a sedative or hypnotic medication to help the patient achieve a good night's rest. If a preoperative medication of a similar type is indicated, it, too, may be prescribed at this consulting appointment.

To help communicate effectively with the patient during the initial consulting appointment, the oral health care professional may use a communication strategy entitled "CLASS."[9] The acronym represents the need to establish an empathetic *Context* for the interview, to *Listen* actively to the patient, to *Acknowledge* the patient's feelings about the interaction, to develop a preventive and restorative treatment *Strategy*, and to provide a *Summary* of treatment and preventive options for the patient

Oral Health Care Pain Control

The International Association for the Study of Pain defines pain as the "sum total of the individual's responses (behavioral, emotional, motivational, and psychological) to actual or impending tissue damage from a noxious stimulus."[8] Oral pain can result from pathology or treatment. Pain reactions differ a great deal from one person to the next, due to each individual's previous experiences with pain and various factors such as fatigue, stress, fear, apprehension, age, emotional state, and education. Pain is a major factor that brings patients to the oral health care office, while fear and anxiety about pain are common reasons patients fail to seek oral health care. Many clinicians in health care consider pain to be the "fifth vital sign."

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According to the National Institutes of Health, the magnitude of this public health problem is exemplified by the fact that there are 35 million Americans who avoid oral health care treatment until forced into the office with a toothache. Many people who do visit a dentist regularly say they view it as a necessary evil.[10] The control of pain is therefore an essential part of oral health care practice.

Pain impulses travel to the brain by way of the neural system. The "Gate Control Theory of Pain" somewhat explains the unusual and complex phenomena of pain beyond what we know about the specific neural anatomic pathway of pain sensation.[11] This theory states that cells near the spinal cord act as a "gate" to modulate impulses from the peripheral nerve fibers. If the gate is hit with too many impulses, it becomes overwhelmed and closes to prevent more impulses from getting through. The first "gates" to close would be the ones that are the smallest. The nerve fibers that carry the impulses of pain are rather small and called "C" fibers. A goal of oral health care should be to keep this gate closed and prevent any pain signals from being received by the central nervous system.

With a high priority given to pain control for patients at high risk for medical emergency, the need for and selection of anesthetic are important to determine. Many studies note that profound anesthesia resulting from vasoconstrictor use prevents the patient with cardiovascular disease (CVD) from producing endogenous epinephrine. This, in turn, can increase stress on patients with CVD, which then can increase the risk of a medical emergency. According to Stanley F. Malamed, DDS, as discussed during his medical emergency seminars (noted earlier), the usual "epi rush" or palpitations usually noted by a patient happen within a few minutes of anesthetization—too soon to be due to the epinephrine supplied by the agent. Instead, they are probably due to endogenous epinephrine associated with stress and anxiety. A recent University of Florida College of Dentistry study found that a person's memory of pain's intensity months after they experienced it may be influenced more by how stressed the person was during the experience than by the actual level of pain.[12]

When treating the patient, vocal sedation is very important (see sidebar on page 31).[13] The information presented at the consultation appointment may be brought up again before treatment, as well as referenced during treatment. Encouragement from the oral health care staff is also helpful in reducing stress in anxious patients. Also, comforting the patient physically with soothing music, warm towels, the aroma of lavender or freshly baked bread, and even a hand or foot massage or paraffin hand treatment can be beneficial to help patients stay relaxed during oral health care procedures. Music therapy for stress relief in dentistry has many studies confirming its value.[14]

Debra Gray King, DDS, FAACD, president of the Atlanta Center for Cosmetic Dentistry and a clinical instructor with The Hornbrook Group, presenters of continuing education seminars on aesthetic dentistry, cautions, "All of these amenities should be undertaken conservatively so as not to distract from fulfilling the core competencies of your practice. If you want to create a more soothing environment, add amenities one at a time so you can gauge patient reaction."[15]

Vocal Sedation

It is important that the dental hygienist talking to the client be calming and let them know that all is well, saying things like "I will be careful," and "I will be using the *'Velvet Touch'*." (See discussion of the *"Velvet Touch"* on page 32.) Care should be taken to warn your patient if some pain is likely: "You might feel a slight prick," or "You may feel a slight 'zing' with this injection" when performing the inferior alveolar block.

The following phrases are appropriate for performing pain control:

- **"I will numb the area so that it will be comfortable and to allow for best treatment."**
- **"I am using this surface anesthetic to make the rest of the procedure more comfortable for you."**
- **"I am depositing solution slowly so it will be more comfortable, but you are not receiving any more than usual."**

Phrases like "It is going to be really painful," or "This might hurt a bit," are inappropriate. The terms "needle," "hurt," and "sharp" should be avoided.

During provision of pain control, the practitioner can evaluate the client's comfort level by asking, "On a scale of one to 10, what is your level of discomfort?" When administering nitrous oxide inhalation, they can ask, "Is this a good time to give the injection?"

Procedures that need added pain control can be put in terms of their esthetic benefits: "After we get your teeth and gums healthy, we will be able to improve your smile further with restorative procedures and tooth whitening," or "Your teeth and gums will be so healthy that your breath will be

Many feel that spa-like comforts are too fancy for the average oral health care setting. However, Larry Lawton, DDS, a dentist for the State of Washington Department of Social and Health Services residential facility for developmentally disabled patients, recently reported his findings using massage techniques in a public facility. Lawton found that many patients were agitated during simple oral health care procedures and required sedation and manual restraint to undergo procedures safely. "As a result of using massage therapy during oral health care treatment, we have recorded a decrease in resistant behaviors and a more positive response to treatment," Lawton says. "The dosage for sedation has been reduced. Use of the mechanical positioning device also has been drastically reduced. Patients who are relaxed as a result of massage seem less resistant and more receptive to [oral health] treatment. Recovery times for patients who do require sedation have been reduced as well."

The University of Iowa's Logan adds that, during the appointment, "Relaxation and deep breathing are two relatively easy strategies that patients may find useful in coping with stressful procedures. Imagery, relaxation training, and hypnosis have been used successfully to treat acute procedure pain (see sidebar below)."[16] A recent article in the *Journal of Dental Hygiene* outlined deep diaphragmatic breathing and focused attention as methods of relaxation that can be used in an oral health care setting.[17]

Hypnosis is a state of inner absorption, concentration, and focused attention. Hypnosis has been shown to give the participants a higher percentage of active helpful immunological cells in studies, as well as allowing for the secretion of endorphins which stimulates the closing of the pain "gate"; these hormones are the body's own opiates. Medical hypnosis was approved by the American Medical Association in 1958 as a form of treatment in all areas of medicine and surgery. Hypnosis is a state of inner absorption, concentration, and focused attention that has been shown to give study participants a higher percentage of active helpful immunological cells and to allow for the secretion of endorphins (hormones that act as the body's own opiates), which stimulates the closing of the pain "gate."[18] The same care should be exercised in selecting a hypnotherapist as in selecting any health care professional.[19]

A hypnotherapist induces a hypnotic state in a client to increase motivation or alter a pattern of behavior. The hypnotherapist consults with the client to determine the nature of problem and prepares client to enter hypnotic states by explaining how hypnosis works and what the client will experience. The hypnotherapist conducts tests to determine the client's degree of physical and emotional suggestibility. He or she then induces the hypnotic state using individualized meth-

Relaxation Techniques

***Guided imagery*—This is the technique of imaging a pleasant experience or a particularly soothing environment. By concentrating on creating as much detail as possible, the mind becomes absorbed in this task rather than focusing on what is happening.**

***Deep breathing*—This technique involves breathing deeply and slowly, which floods the body with oxygen and other chemicals that work on the central nervous system and improve comfort.**

***Progressive relaxation*—Using this technique, there is conscious concentration on relaxing every muscle in the body beginning at the toes and working all the way up to the head. Reducing muscular tension helps reduce pain.**

ods and techniques of hypnosis based on interpretation of the test results and analysis of client's problem. Most importantly for the future oral health care needs of the patient, the hypnotherapist may train the client in self-hypnosis.

Victoria A. Perper, RDH, a certified clinical hypnotherapist, calls hypnosis a wonderful adjunctive therapy for any oral procedure for a client who is "fearful or has just had a bad day, and the very last thing they want to deal with is dental appointment." She says that in a "matter of minutes, through hypnosis, a patient can become totally relaxed. With a receptive client, the clinician has the ability to use verbal scripts, which utilize visualization, and take the client completely away from what the clinician is doing." However, Perper allows that the client under hypnosis is still totally aware of their surroundings and can hear voices and the other sounds of the office. The client is able to rinse and to say if something is uncomfortable, but is no longer frightened or agitated. She says that the client "does not pull away from you, and [their] mouth is completely relaxed. Tongue thrusting, tightened lips, coughing and/or gagging, is completely eliminated. And because the patient is so relaxed, the time goes by very fast." Because of hypnotic interventions, "dental care becomes routine, broken appointments diminish, and the patient becomes more accepting of and comfortable with more complicated procedures."

Inhalation of nitrous oxide (N_2O) may also be considered to relieve any stress during treatment. One of the main benefits of nitrous oxide (N_2O) is that the sedation can be tailored to the patient's needs.[20] The oral health care staff must continually observe the patient for any indication of changes in sedation level; changes in the amount of gas take about 30–60 seconds to become apparent to the patient.

The percentage of N_2O noted in a patient's chart for a previous appointment is not always directly relevant to the current appointment. It is a common mistake to automatically deliver a preset percentage of N_2O to a patient. For most oral health care treatment, 50% or less N_2O is effective for achieving baseline level of the gas and is now considered minimal sedation. Nitrous oxide is a strong analgesic but a weak anesthetic, making it effective in anxiety-control for oral health care treatment and helpful as an adjunct in pain control.

Nitrous oxide is a strong analgesic but a weak anesthetic.

While some patients may report that the sensation of "pain" is more tolerable with the use of nitrous oxide, inhaled N_2O cannot eliminate pain altogether; therefore, local anesthetic should still be used for oral health care procedures. Practitioners can choose to use nitrous oxide sedation strictly to reduce the fear and discomfort of the injection of local anesthetic, or to use it throughout the entire appointment. This choice can be based on patient need and desire, cost, and the patient's general health. If N_2O is going to be used throughout the planned treatment, the patient may still need an additional amount for the injection that can be reduced later. Usually, the increase is by 5% N_2O (0.5 liter per minute) and a decrease of the same of O_2.

The actual local anesthetic injection can increase patient stress. For many patients, this is the single most common reason for avoiding oral health care, so certain procedures should be incorporated when injections are administered. The *"Velvet Touch"* (concept promoted by the author) method incorporates both vocal sedation and therapeutic touch as with other dental hygiene procedures, but also emphasizes how the injection is given. Of course, the practitioner needs to employ appropriate injection technique. In addition, topical anesthetic is placed for at least one minute, but preferably two to three minutes. The tissue is kept taut and the bevel is placed toward the bone.

The main concern for pain control with local anesthesia, though, is the slowness of the injection, with each full cartridge being dispensed over the course of one minute. The needle itself is not the major cause of discomfort; rather, the pressure and the volume of the fluids being injected cause distress. Pressure anesthesia is used for palatal injections to "close the gate" to any discomfort. The *"Velvet Touch"* includes several other patient-centered considerations, including keeping the syringe and tray out of sight of the patient.

Acupuncture—an ancient therapy that involves the use of needles inserted under the skin at key points in the body including the head and neck—is another tool that some oral health practitioners believe can reduce stress. Acupuncture has been in use as early as 5,000 years ago in many countries of the world, but the science was developed in China. Recent studies have shown that the possible therapeutic action of acupuncture can be attributed to the natural secretion of several helpful endogenous substances that contribute to closing the pain gates. A pilot study in the United Kingdom in 2003 showed that the onset time of local anesthesia is reduced if acupuncture is given prior to the inferior alveolar block.[21]

Patients with excessive fear or anxiety also might benefit from the services of a licensed therapist.[22] Local hospitals may offer stress reduction programs and referral for therapy, and local dental schools may have fear clinics for patients. A brochure on the subject of psychology and dentistry is available (see references) that explains that psychologists are experts in stress management who can teach the oral health care patient relaxation and stress-reduction techniques.[22]

Posttreatment Stress Protocol

The oral health care staff needs to spend extra time seeing that the patient at risk for a medical emergency is comfortable after treatment. Posttreatment recommendations should be written out as well as given verbally to the patient and/or caregiver. Posttreatment pain- or anxiety-control medication may also be considered at this time. Most people experience some pain after scaling and root planing (SRP) (term used by researchers in study for what is now called periodontal debridement), generally in the faint-to-moder-

ate intensity range.[23] New patients tend to report longer duration of mild or greater pain than maintenance patients after SRP. However, most patients do not need medication after the day on which SRP is performed.

To manage pain posttreatment, the patient can be advised to take an over-the-counter (OTC) nonsteroidal antiinflammatory drug (NSAID) like ibuprofen, to reduce the inflammation associated with pain. The NSAID may be optimized by preoperative administration, with continued dosing according to a regular schedule to minimize inflammation (and thus pain)—and not "as needed for pain." The supervising dentist can also prescribe COX-2 inhibitors such as Celecoxib, Rofecoxib, and Valdecoxib.[24,25] In the presence of tissue injury, certain chemicals are released, and COX-2, an inducible enzyme, increases. The gastrointestinal (GI) side effects of NSAIDs, a mainstay of pain treatment, are staggering and can be related to morbidity, even though most are sold OTC. COX-2 inhibitors have the analgesic properties of all the other NSAIDs, but fewer GI side effects. This may be because COX-2 inhibitors do not block the COX-1 enzyme, which helps maintain the stomach lining. Care must still be taken when prescribing certain NSAIDs to patients with renal disease.

Finally, the oral health care office can establish the comfort of the patient and enhance stress reduction with a courtesy follow-up phone call the day of treatment. This also gives the patient the opportunity to report any medical complications that may have arisen posttreatment.

Conclusion

The employment of stress reduction and pain control may also help prevent medical complications and emergencies. In addition, oral health care staff's stress during a patient's treatment will also be reduced. Following a stress-reduction protocol can make the oral health care setting more pleasant, and most importantly, safer for patient treatment.

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