

Cognitive-Behavioral Management of Recurrent Headache Disorders:
A Minimal-Therapist-Contact Approach

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Behavioral treatments can be efficacious when used either as an alternative or as an adjunct to medication in the treatment of recurrent headache disorders. In this chapter we provide a brief guide to the behavioral treatment of migraine and tension-type headache. We focus on minimal-therapist-contact treatment (MTCT), or home-based treatment, because clinic based treatment has been described elsewhere (Blanchard & Andrasik, 1995; Martin, 1993) and interest in brief cost-effective treatment that can be integrated with medical clinic appointment schedules is currently high.

First, we briefly review the epidemiology and impact of migraine and tension-type headaches, and describe the clinical characteristics of these two disorders and of frequently co-occurring headaches associated with medication overuse. Next, we offer suggestions for the assessment and the selection of patients for behavioral treatment. The body of the chapter then provides a description of minimal-therapist-contact behavioral treatment, with emphasis on clinical issues and predictable obstacles likely to confront therapists.

EPIDEMIOLOGY AND IMPACT OF HEADACHE

In the United States alone, migraine is experienced by 18% of women and 6% of men (25 to 30 million individuals; Lipton, Stewart, Diamond, Diamond, & Reed, 2001; Stewart, Lipton, Celentano, & Reed, 1991). Tension-type headache, a more common but less disabling condition, affects 38% to 78% of people (Rasmussen et al, 1991; Schwartz et al., 1998). As the frequency and severity of migraine or tension-type headaches increases, the impact of headaches on daily functioning also increases (Holroyd et al., 2000; Schwartz et al., 1998). Approximately 31% of migraine sufferers miss work, and between 58% and 76% of migraine sufferers discontinue normal household activities or cancel family or social activities (Lipton, Stewart et al., 2001). See Lipton, Hamelsky, and Stewart (2001) and Lipton, Stewart, and Von Korff, (1995) for additional information.

CLINICAL CHARACTERISTICS AND DIAGNOSIS

Clinicians working with headache patients should use the diagnostic criteria of the Headache Classification Committee of the International Headache Society (IHS; Olesen, 1988). The majority of headache sufferers (probably over 95%) have benign, idiopathic headaches such as migraine and tension-type headache. These headaches may be considered episodic if they occur fewer than 15 days in the month and chronic if they occur more often. A subset of chronic headaches also are associated with overuse of acute headache medications.

Migraine

The prototypic migraine is characterized by pulsating pain of moderate to severe intensity sufficient to inhibit or prohibit daily activities. The migraine episode lasts four to 72 hours and is accompanied by nausea or vomiting, or both, a heightened sensitivity to light and sound, and is aggravated by routine physical activities (e.g., climbing stairs). The head pain is often unilateral and frequently originates

behind or around the eyes and then radiates to the frontal and temporal regions, and may progress to encompass the entire head. Thought, memory, and concentration may be impaired, and the sufferer may also experience light-headedness, irritability, anorexia, diarrhea, and scalp tenderness. For the minority of headache sufferers who experience migraine with aura, the pain is preceded by temporary focal neurological symptoms that are most often visual disturbances (e.g., bright spots or stars, a scintillating scotoma), but may include sensory disturbances (e.g., paresthesias), motor weakness, or syncope. Many patients with migraine headache experience tension-type headaches as well.

Tension-type Headache

The prototypic tension-type headache is characterized by bilateral nonthrobbing (pressing-tightening, dull, band-like or cap-like) pain of mild to moderate intensity that may inhibit, but not prohibit, daily activities. The pain is typically located in the forehead, neck, and shoulder areas. The typical tension-type headache may last 30 minutes to seven days and is usually not aggravated by routine activities, accompanied by nausea or vomiting, or preceded by focal neurological symptoms. Tension-type headaches occurring 15 or more days/month (chronic tension-type headache) are common in clinical settings although infrequent in the population at large.

Headache Associated with Substances or Their Withdrawal

The frequent use of prescription and nonprescription analgesic medications and abortive medications (combination analgesics, opiates, nonopioid analgesics, barbiturates, ergots, and other abortive agents including triptans) can both worsen headaches and render headaches refractory to what would otherwise be efficacious drug and nondrug therapies (Diener & Tfelt-Hansen, 1993; Diener & Wilkinson, 1988; Markley, 1994; Rapoport & Sheftell, 1993). Medication overuse headache (often referred to as “rebound headache”) is estimated to occur in up to 30% of people treated in headache centers (Diener & Dahlof, 2000) and should be suspected when acute medications are used 20 days monthly for at least a three-month period. Individuals with rebound headaches are seldom pain-free and the headache characteristics overlap with those of chronic tension-type and migraine headache. Rebound headaches can only be managed effectively if the use of the offending medications is reduced or eliminated.

ASSESSMENT

Medical Evaluation

Prior to initiating behavioral treatment, a medical evaluation is needed to rule out headaches secondary to a disease state or structural abnormality. Secondary headaches often are associated with one or more of the following “red flags”: (1) recent or sudden onset (“first or worst headache”) of headaches; (2) recent head trauma; (3) changing or progressive symptoms, or accompanying neurological symptoms (other than the focal neurological symptoms associated with migraine aura), (4) headache associated with fever or other signs of infection, or (e) new onset of headache in a patient over age 50 or in a patient with cancer

or human immunodeficiency virus. Appearance of a “red flag” at any point during treatment is cause for referral for an additional medical evaluation. The use of medications that might aggravate headaches (oral contraceptives, antidepressants, bronchodilators, phenothiazine derivatives, sedatives) also should be assessed.

Diagnostic and Headache History

Patient assessment includes standardized tests and a clinical interview. Standardized instruments can be used to assess (1) presence of co-morbid psychiatric disorders (e.g., PRIME-MD Patient Questionnaire; Spitzer et al., 1994), (2) degree of depression (Beck Depression Inventory; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and anxiety (e.g., State-Trait Anxiety Inventory; Spielberger, Gorsuch, & Lushene, 1970 or Beck Anxiety Inventory; Beck & Steer, 1993), and (3) disability or impact of headache on work, family and social functioning (e.g., MIDAS; Stewart, Lipton, Kolodner, Liberman, & Sawyer, 1999, or the Headache Disability Inventory; Jacobson, Ramadan, Aggarwal, & Newman, 1994). The clinical interview builds on the information gathered from the questionnaires and includes a diagnostic headache evaluation, headache history, and a psychological evaluation. The diagnostic headache evaluation follows the IHS classification system criteria (IHS; Olesen, 1988). The headache history includes a review of headache precipitants, impact of headache on work, family and social functioning, and current and previous treatment (i.e., use of emergency department, medication, alternative treatments) for headaches. The psychological evaluation includes a review of psychiatric history, mental status examination, and current psychological diagnosis (we use the PRIME-MD Diagnostic Interview; Spitzer et al., 1994). Relevant medical and social history information is also gathered.

With the increased likelihood of psychiatric conditions in those with migraine (Breslau & Davis, 1993; Breslau, Merikangas, & Bowden, 1994) or chronic tension-type headache (Holroyd et al., 2000), screening for a psychiatric disorder is an important component of the behavioral evaluation. If a psychiatric disorder is identified, it is important to determine whether this disorder is likely to compromise the efficacy of behavioral treatment (see following section on Patient Selection).

Headache Diaries and Self-Monitoring Records

We ask patients to record medication use and headache activity four times a day (upon arising, lunch-time, dinnertime, and bedtime). These headache diaries, valuable for assessing treatment outcome, are completed for about a month prior to treatment (if possible), throughout treatment, for about a month after treatment, and at a follow-up evaluation. At other points in treatment, we ask patients to also record other relevant information such as relaxation practice, headache precipitants, or thoughts and behavior in stressful situations. At each clinic visit we review headache diaries and any self-monitoring forms to gather information useful to the treatment process. This can include information relevant to identifying

patterns in headache activity, headache precipitants and early warning signs of headache onset, and difficulties in learning self-management skills.

Patient Selection

There are no firm guidelines to assist the clinician in identifying people who are well suited for behavioral treatment, especially minimal-therapist-contact treatment (MTCT). Nonetheless, the requirements of MTCT and the limited information from empirical data suggest attention be paid to the following factors.

- 1) Limited reading comprehension, low-intelligence, or significant cognitive impairment. Patients with reading comprehension below the eighth grade level; below-average intelligence; deficits in concentration, attention or memory; or organic brain damage typically will have difficulty making effective use of the written materials and audiotapes.
- 2) Misuse or overuse of medication. Patient will need to reduce or eliminate offending medications if there is evidence of medication overuse (use of acute medications 20 days monthly). Patients who have difficulty reducing their medication use on their own may benefit from additional treatment sessions during this period. Patients overusing barbiturates or opioids may require medical supervision to eliminate these medications.
- 3) Chronic daily severe headache. Patients with near-constant headaches that are sometimes severe typically respond poorly to relaxation and biofeedback therapies, even when excessive medication use is not an aggravating factor (Blanchard, Appelbaum, Radnitz, Jaccard, & Dentinger, 1989). Clinicians commonly assume that patients with chronic daily headache require aggressive multimodal therapy that includes prophylactic medications and multiple behavioral interventions over a longer period of time than that afforded in a MTCT protocol.
- 4) Nonadherence. Patient does not complete assessment questionnaires, headache diaries, or homework assignments. Some patients simply do not persist in efforts to learn or apply self-regulation skills without regular contact with a health professional. Consideration may be given to offering traditional clinic-based treatment or motivational enhancement therapy (Miller & Rollnick, 1991; see also Jensen chapter in this volume).
- 5) Psychiatric comorbidity. Patient is significantly impaired by a psychiatric disorder that requires attention (e.g., severe major depressive episode, severe anxiety disorder, post-traumatic stress disorder, somatization disorder, psychosis) or has a personality disorder (e.g., histrionic, borderline, dependent). The presence of psychological symptoms or a co-morbid psychiatric disorder does not usually prohibit behavioral treatment. Combined psychological and pharmacological treatment should be considered (Holroyd, Lipchik, & Penzien, 1998) and additional treatment sessions may be required to address psychological problems. Cognitive-behavioral interventions for depression (Beck, Rush, Shaw, & Emery, 1979;

Robinson, Berman, & Neimeyer, 1990) and anxiety (Barlow, 1993; Borkovec & Whisman, 1996; Gould, Otto, Pollack, & Yap, 1997) can readily be incorporated into cognitive-behavioral interventions for recurrent headache disorders.

- 6) Age. Some older patients have difficulties with attention or concentration or other problems that affect the learning of novel material. Although they typically would not benefit from MTCT, they can benefit from a clinic-based program that is modified to include weekly phone consultations, additional time to practice elementary skills before more advanced skills are introduced, and more detailed verbal and written explanations of treatment procedures (e.g., Arena, Hannah, Bruno, & Meador, 1991; Mosley, Grotheus, & Meeks, 1995).

BEHAVIORAL TREATMENT

Efficacy

Numerous qualitative and meta-analytic reviews have concluded that behavioral treatment yields a 40% to 60% reduction in migraine or tension-type headaches in adults, with MTCT and clinic-based treatment formats yielding similar outcomes (e.g., Blanchard, 1992; Blanchard, Andrasik, Ahles, Teders, & O'Keefe, 1980; Bogaards & ter Kuile, 1994; Haddock et al., 1997; Holroyd, in press; Holroyd & Penzien, 1986; 1990; Rowan & Andrasik, 1996). Children and adolescents may show somewhat better outcomes than adults (Hermann, Kim, & Blanchard, 1995; Holroyd, in press; Holroyd, Lipchik & Penzien, 2001).

The US Headache Consortium, a consortium of influential medical organizationsⁱ drew on comprehensive evidence reports commissioned by The Agency for Health Care Research and Qualityⁱⁱ (AHCQRQ; Goslin, Gray, & McCrory, 1999) when they included relaxation training, thermal biofeedback combined with relaxation training, EMG biofeedback, and cognitive-behavioral therapy as empirically supported treatments in current clinical practice guidelines for the management of migraine (Campbell, Penzien, & Wall, 2000; Silberstein & Rosenberg, 2000). Similar clinical practice guidelines have yet to be developed for tension-type headache, but the initial step of evaluating the evidence base for the use of behavioral treatments has been completed (McCrory, Penzien, Hasselblad, & Gray, 2001).

Treatment Formats

Treatment can be administered individually or in a group and can be administered in a clinic-based treatment format or in a minimal-therapist-contact treatment format. *Minimal-therapist-contact treatment (MTCT)*, or *home-based* treatment formats were developed to reduce the cost and increase the availability of behavioral treatments

Session structure. With both treatment formats, clinic sessions typically include: (1) a review of self-monitoring forms and homework, (2) a discussion of any difficulties in learning and applying self-

management skills up to this point, (3) the presentation of the rationale for the new headache management skill that is the focus of the present session, (4) instruction and practice in this new skill, (4) formulation of a homework assignment, and (5) summary. The goal of the skill-training portion of the session is patient demonstration of the skill during the session (e.g., role plays stress-management skills) in at least rudimentary form so that the therapist can directly observe the patient's efforts, identify problems, and provide corrective feedback.

Clinic-based treatment. Clinic-based treatment is likely to involve six to 15 or more weekly sessions, 45 to 60 minutes in length when treatment is administered individually, and 60 to 120 minutes in length when administered in a group. This treatment format offers more therapist time and attention, and allows the therapist greater opportunity to directly observe the patient than does MTCT, but requires the patient to travel more frequently to the clinic, and thus places a greater burden on the patient's schedule. The reader interested in descriptions of clinic-based treatment delivered in individual formats is referred to Blancahrd and Andrasik (1985), and Martin (1993) for individual format and Scharff (1994) for group format.

Minimal-therapist-contact treatment (MTCT). MTCT involves three to four monthly treatment sessions that are 45 to 60 minutes in length when treatment is administered individually and 60 to 120 minutes in length when administered in a group. Clinic visits are used to introduce headache management skills and to address problems encountered in acquiring or implementing these skills. The actual learning and refinement of headache management skills is guided by patient manuals and audiotapes, and occurs at home. MTCT thus relies heavily on written materials and audiotapes that guide patients in learning and applying headache management skills at home.

In the protocols we describe, treatment involves four monthly clinic visits (in addition to the initial evaluation) with three brief phone consultations interspersed between clinic visits (see Table 1). Patient manuals and audiotapes guide patients through each of the treatment components described below.

Insert Table 1 about here

Overview of treatment

Tension-type headache. The primary treatment components for tension-type headache are relaxation training, cognitive-behavioral stress management (cognitive coping, problem solving), and pain management (see Table 1). The first month of treatment is focused on relaxation training, the second month on stress management (with an emphasis on either cognitive coping or problem-solving), and the final month on the development and refinement of relaxation and stress-management skills and on the incorporation of pain management strategies into the patient's armentarium. At the final treatment

session, the focus is on integrating the headache management skills that have proven effective for a given patient into a headache management plan, and on the further development and maintenance of these skills. In practice, treatment may be more individualized than this protocol suggests; although most patients are likely to follow this schedule, a few patients do well with only the relaxation and pain management components. The time devoted to each treatment component also may vary with the patient's needs and interests.

Migraine. Table 1 also outlines the protocol for the behavioral treatment of migraine. The first month is focused on relaxation training (as in the tension-type headache protocol). The second month is focused on the development of a RESCUE plan to respond to migraine triggers and warning signs. As part of this plan, a strategy is developed for effectively using both migraine medications and behavioral headache management strategies. The third and final month is devoted to one of three possible options: (1) continued focus on the “basic” migraine management skills that have already been covered, (2) introduction of stress-management (cognitive coping) training, or (3) introduction of thermal (hand-warming) biofeedback. In addition, pain management skills (as in the tension-type headache protocol) are incorporated into the patient's armamentarium.

An examination of Table 1 shows how migraine and tension-type headache management diverge in months two and three. Although both the tension-type headache and migraine protocols include relaxation training and pain management as standard treatment components, in the migraine protocol (1) stress management is an optional component and does not include problem solving, (2) trigger identification and modification as well as effective use of medications receive greater attention, and (3) flexibility in the treatment components is more explicitly built into the protocol and thermal biofeedback is an optional treatment component.

COMPONENTS OF BEHAVIORAL TREATMENT

In this section, we present a description of the treatment components included in our MTCT protocols for tension-type headache and migraine. We do not present detailed descriptions of these techniques; rather, we highlight issues involved in the application of these techniques to the management of recurrent headache disorders (see other chapters in this volume).

Patient Education

Recognizing and addressing counter-therapeutic beliefs and instilling realistic expectancies for treatment is a necessary first step in behavioral treatment. The rigid attribution of headaches to a single, stable, uncontrollable cause (e.g., “It's just the weather,” or “There's nothing I can do because it runs in my family”) is likely to undermine involvement in behavioral treatment. Patients who adopt a passive stance in treatment because they assume only the therapist or only medication can help also are unlikely to put forth the effort required to learn headache management skills. Patients who expect complete or immediate

relief, or who use headache management skills only when crippled by a severe headache will likely become disillusioned and discontinue treatment.

It is critical to insure that patients understand behavioral treatment. We use the initial part of the first treatment session to inform patients about this treatment approach, their role in the treatment, and what they can expect in terms of outcome.

1. Structure of behavioral treatment for headache. Orientation begins with an overview of the structure of behavioral treatment including a brief discussion of the treatment components (e.g., relaxation, biofeedback, stress management) and an outline of the number of sessions, timing of sessions, length of sessions, and structure of sessions.

2. Rationale for behavioral treatment of headache. We also provide a clear rationale for behavioral treatment of headache. We present a biopsychosocial model that conceptualizes headaches as a biological disorder in which multiple environmental, social, physical, and psychological factors play a role in the onset, course, and maintenance of headaches. The biopsychosocial model helps patients understand the relevance of psychological and behavioral interventions without conceptualizing their headaches as a psychological problem. Relaxation training is introduced as a method for reducing physical arousal and muscle tension that may be both precipitant and consequence of headaches and thermal biofeedback as a method of controlling vascular responses in migraine. Stress-management interventions (i.e., cognitive-behavioral strategies) are introduced as methods to reduce psychological reactions to stress that may trigger, aggravate or maintain headaches. The overall rationale for behavioral treatment is introduced during the initial treatment session; at each subsequent session a specific rationale is provided for the interventions that will be introduced in that session.

3. Treatment involves an active role from the patient and collaboration with the therapist. Patients may enter treatment assuming they will be passive recipients of treatment, with attendance at scheduled appointments as their only responsibility. This belief will interfere with treatment adherence and is best addressed when initiating treatment. Thus, it is essential to orient patients to the collaborative process, explaining that collaboration requires active involvement of both the therapist and the patient. We explain that the role of the therapist is not to take responsibility for fixing the headaches but to provide tools for the patient to learn to better manage headaches.

4. Homework and home-based treatment. As part of the process of patients learning to take an active role, we stress that clinic visits are a small part of their treatment. We want patients to understand that completion of monitoring forms and practice of headache management skills at home are essential because few clinic visits are scheduled to monitor progress and learn and practice these skills. Thus, we inform patients that benefits from behavioral headache management are contingent on regular practice.

5. Developing realistic expectations for treatment outcome. In helping patients to develop realistic expectations for improvement, we explain that a “cure” is not likely. We tell patients that by applying skills and making lifestyle changes, they are likely to experience moderate reductions in headache activity; a reduced need for drug therapy; improvements in affective distress, quality of life, and functioning; and a restored sense of personal control over headaches. We explain that we cannot predict who will benefit, or the exact benefit a particular patient will receive. We also warn that improvement is not likely to be observed until headache management skills are used for a number of months. Although we acknowledge that headache management skills may impact the duration and severity of headache episodes, we emphasize that behavioral treatments are to be used regularly with the result being the *prevention* of headache episodes.

Therapist Attitude

Because patients' confidence in their ability to manage their headaches may be more important than their ability to regulate a specific physiological responses (Blanchard et al., 1983; Holroyd et al., 1984), it is important for the therapist to attend to patients' perceptions of their performance as well as to their actual performance during skill training. We review the patient's performance with optimism, initially magnifying small successes and normalizing any problems as manageable phases of treatment. We encourage patients to take credit for their successes throughout treatment. We remind them, we serve primarily as a teacher and a coach, while they do the more difficult work of experimenting with and refining the various headache management techniques.

Relaxation

Orientation. We explain that relaxation skills may enable the patient to (1) decrease their overall level of muscle tension and autonomic arousal, and (2) recognize subtle signs of increased muscle tension so they can apply brief relaxation skills to prevent the buildup of additional muscle tension.

Relaxation training includes abbreviated progressive muscle relaxation (PMR) training and “quick relaxation” techniques that we encourage patients to use throughout the day. We teach a variety of “quick relaxation” skills including abdominal breathing, relaxation by recall, cue-controlled relaxation, and autogenic phrases. It is unrealistic to expect patients to become proficient in all of these strategies, or to build all the strategies into their repertoire. Instead, we encourage patients to learn and try each of the strategies before deciding on those they want to build into their regular routine. Full scripts of relaxation sessions with instructions for therapists are presented elsewhere (Blanchard and Andrasik, 1985; Bernstein & Borkovec, 1973; Bernstein & Carlson, 1993; see also chapter by Syrjala and Abrams in this volume). These resources also provide instructions for teaching the “quick relaxation” skills we use.

Instruction. Prior to initiating PMR training, abdominal breathing is introduced (see Quick Relaxation Skills) and patients are instructed to practice abdominal breathing periodically during the

PMR training session. Throughout the training session, we monitor behavioral signs of relaxation (see Table 2) and ask the patient to repeat a tension-release cycle if we notice a muscle group has not relaxed.

Insert Table 2 about here

Progressive Muscle Relaxation (PMR) training begins with tension-release cycles in order to relax the entire body. Muscles of the shoulders, neck and face receive the greatest attention because they are most likely involved in headaches. At the end of PMR training, an image, selected by the patient prior to PMR practice, is used to demonstrate the use relaxation through guided imagery (see Quick Relaxation).

We suggest patients practice PMR at the least once, and preferably twice a day, in the morning and in the afternoon or evening. We require patients to keep records or logs of their home practice. The log includes the date of practice and relaxation ratings before and after practice using a rating scale from 0 (no tension, or most relaxed you can imagine) to 100 (extremely tense, or the most tense you can remember). We pay particular attention to problems that are commonly encountered during relaxation training and possible therapeutic responses. These are presented in Table 3.

Insert Table 3 about here

When patients have mastered the initial muscle relaxation procedure, they are encouraged to practice briefer tension-release cycles using the audiotapes that are provided (see Table 2). Progress is determined by the individual needs of each patient. If an anxious patient has extreme difficulty concentrating, we may introduce only muscle stretching and abdominal breathing at the first session. Once a variety of brief relaxation techniques (see below) have been mastered, the focus shifts to incorporating brief relaxation skills into daily living. Even moderate levels of muscle tension, or a situation that has been associated with tension in the past, becomes a cue to use brief relaxation skills.

Muscle Stretching. Muscle stretching exercises strengthen and lengthen sore and tight pericranial muscles. Gentle neck and shoulder stretches using sideways turns of the head, forward bends and diagonal bends of the neck and head are demonstrated (e.g., DeGood, 1997). The patient with a head-forward posture is instructed to monitor head and neck posture and to use chin tucks throughout the day to change this postural habit. The patient is instructed to perform brief gentle stretches intermittently throughout the day, as well as immediately prior to practicing PMR. We explain that, as they progress, they will be more aware of muscles that tighten prior to, or early in a headache episode. This will allow them to stretch or relax muscles strategically, preventing muscle tension from developing into a full-

blown headache. Muscle-stretching exercises need to be done gently so that already constricted shoulder and neck muscles are not extended so far as to induce pain or injury.

Muscle Scanning and Quick Relaxation. Quick relaxation techniques enable the patient to rapidly evoke the relaxation response that was learned during PMR training. Therefore, before attempting “quick relaxation” it is important that the patient is able to relax deeply when practicing the full version of PMR.

In order to provide information patients can use to decide when to use quick relaxation techniques, they are asked to periodically “scan” or monitor sensations of muscle tension, particularly in the shoulders, neck, and face, during the day. Scanning increases awareness of even low levels of muscle tension. Identifying low levels of tension then provides a cue for the early use of one of the quick relaxation techniques. This will help to *prevent* muscle tension from increasing and developing into a headache. Patients are encouraged to use specific cues such as a change of work tasks, the alarm on their wristwatch or computer, or stick-on colored dots placed in strategic locations to provide a signal to use “quick relaxation” skills. With practice, the external reminders may no longer be needed as patients will have integrated muscle scanning and their preferred quick relaxation techniques into their daily routine.

Abdominal breathing. Abdominal or diaphragmatic breathing brings inhaled air to the base of the lungs, where oxygen is most efficiently transferred to the bloodstream. Abdominal deep breathing involves slow deep breaths (about 10 breaths per minute), with exhalation longer than inhalation. Initially patients are asked to practice abdominal breathing for five to 10 minutes twice daily. Patients are also asked to subvocalize the word “relax” with each exhalation, as they attend to the rhythm of their breathing. In time, the subvocalized “relax” can serve as a cue to trigger a quick relaxation response (see cue-controlled relaxation). When first learning diaphragmatic breathing, some patients may overly focus on the mechanics of the technique while trying to do it “correctly.” This can be counter-productive to the elicitation of the relaxation response. Instructing these patients to simply observe their breathing can be helpful.

Guided imagery. In guided imagery a pleasant relaxing image is called to mind and attention focused on the sensory details (e.g., sensations of light, color, sound, temperature, texture, physical activity) in this image (see Syrjala and Abrams chapter in this volume). Using imagery can be helpful in evoking a quick relaxation response as well as providing a brief respite from a stressful situation. We incorporate instructions for guided imagery into the PMR protocol to further deepen relaxation. It is not expected that all patients will have the ability to easily develop an image or use imagery as a quick relaxation strategy.

Relaxation by recall/Cue-controlled relaxation. In relaxation by recall the relaxation response is produced without tensing muscles, by mentally evoking sensations of relaxation in specific muscle groups. The patient first identifies sensations of tension in specific muscle groups (e.g., by muscle

scanning) and then mentally evokes or recalls sensations of relaxation, maintaining sensations of relaxation for 30 to 40 seconds. Typically a cue or signal (e.g., the word “relax”) that has been repeatedly paired with the relaxation response during PMR practice is used to evoke the relaxation response, hence the term cue-controlled relaxation.

Autogenic training. Autogenic training (AT) is a system of psychosomatic self-regulation that permits the gradual acquisition of autonomic control. In AT phrases such as “my forehead is cool”, “my arms feel heavy and warm,” or “I feel relaxed and at peace,” are subvocalized as the patient concentrates on his or her body sensations in a passive manner evoking the physiological sensations and mental state described in the phrase (Schultz & Luthe, 1959). We instruct patients to become aware of what appears to be their random thoughts and images, or “mental traffic.” We suggest they use autogenic phrases to counteract their racing, automatic thoughts in order to control their “mental traffic” and facilitate deep relaxation.

Identifying Early Warning Signs and Headache Precipitants

Orientation. If patients are alerted to common migraine triggers and *early warning signs* or prodromal symptoms and these are recorded prospectively, most patients can learn to identify both headache triggers and early headache warning signs. This information is valuable because it allows patients to take more effective action to prevent or manage their headaches. Identification of previously unrecognized triggers opens up new options for the prevention of headaches. Prodromal symptoms can provide early warning signs or cues to employ behavioral headache management skills or, where appropriate, to use medication abortively.

Instruction. We assist patients in systematically recording possible prodromal symptoms and in evaluating their significance. Prodromal symptoms can be psychological, neurological, or general (constitutional, autonomic). Psychological symptoms include irritability, depression, moodiness, euphoria, restlessness, hyperactivity, fatigue, and drowsiness. Neurological symptoms include photophobia, phonophobia, hyperosmia, yawning, dysphasia, and difficulty concentrating. General symptoms can include stiff neck, food cravings, cold feeling, anorexia, increased thirst, fluid retention, frequent urination, diarrhea or constipation, sluggishness. These prodromal symptoms differ between people, but are fairly consistent within the same person.

Although prodromal symptoms may be difficult to link to migraine episodes initially, it is helpful for patients to learn to identify them so that they can predict an attack and prepare for it. To help identify prodromal symptoms, we ask patients to record any “odd” or “just not right” sensations they experienced prior to the onset of the migraine. Next, we ask patients to identify how often these symptoms occur without getting a migraine. This enables patients to determine whether a symptom is truly a prodromal symptom.

An aura occurs prior to headache onset or early in a headache episode, lasts approximately 30 minutes and is typically visual (i.e., blurred vision, photopsia, fortification spectra), but may also include parathesias, olfactory hallucinations, motor weakness, ataxia, dysarthria or aphasia, and conscious trance-like states. Aura symptoms are reviewed so the minority patients with aura can utilize these early warning signs in the same fashion as they would prodromal symptoms.

We also assist patients in systematically recording possible headache precipitants and evaluating their significance. Many precipitants are relevant for both migraine and tension-type headache. General population studies indicate stress, sleep difficulties, and hormonal factors (relevant specifically for migraine) are the most frequently identified triggers (Rasmussen, 1993). The most common headache precipitants, or triggers, identified by people with headaches are listed in Table 4.

Insert Table 4 about here

We explain that headache precipitants are not universal and do not necessarily precipitate an attack on every exposure. Headaches may occur hours after exposure to a headache trigger. Several precipitants occurring within close proximity are more likely to trigger a migraine than a single precipitant. Patients begin by noting if particular settings, times of the day or week, or activities are associated with headache onset. They also review the 12 hours or so prior to each headache onset for possible headache precipitants to determine if a pattern emerges. Prospective monitoring often identifies triggers that had not been noticed or were overlooked.

Stress. Stress is the most frequently identified headache precipitant for both migraine and tension-type headache (Rasmussen, 1993). The relaxation techniques and cognitive-behavioral interventions address headaches that occur in response to stress.

Sleep. Individuals with either migraine or tension-type headache frequently identify sleep difficulties as a headache precipitant, with insufficient sleep, oversleeping, or an irregular sleep schedule identified as the most common sleep precipitants (Rasmussen, 1993; Sahota & Dexter, 1990). Patients with these sleep complaints are instructed in sleep hygiene and advised to maintain a regular sleep schedule. Practicing relaxation techniques prior to bedtime may facilitate sleep onset. Cognitive-behavioral interventions also can reduce sleep maintenance problems (Edinger, Wohlgenuth, Radtke, Marsh, & Quillian, 2001). Headaches also may arise as a consequence of a primary sleep disorder, such as sleep apnea; thus, it is worthwhile to screen for the presence of a sleep disorder and to refer to a sleep specialist when a sleep disorder is suspected (Paiva, Batista, Martins, & Martins, 1995).

Hormonal Factors. Reproductive hormones (menarche, menstruation, pregnancy, menopause, hormone replacement therapy) are associated with headache disorders, particularly migraine (for reviews

see Holroyd & Lipchik, 1997; Holroyd & Lipchik, 2000; Silberstein & Merriman, 1997). The behavioral treatments discussed in this chapter are effective in managing these headaches (for review see Holroyd & Lipchik, 1997; Holroyd & Lipchik, 2000).

Meal Schedules and Dietary Factors. Close to 30% of people with headaches, primarily those with migraine, report that dietary factors, such as skipping or delaying meals, or ingesting specific foods, beverages, or ingredients sometimes trigger their headaches (Robbins, 1994). Few double-blind studies of dietary triggers have been conducted and clinical opinions differ regarding the benefits from dietary alterations (Blau & Thavapalan, 1988; Medina & Diamond, 1978; Silberstein et al., 2001). Most people with headaches do not require severely restricted diets, but should avoid foods or additives that they believe might trigger a headache. Generally, it is advised that people with migraine consume alcohol, particularly red wine, with caution. People with migraine may also benefit from a trial of limiting or eliminating monosodium glutamate, aspartame, and nitrites as these substances often trigger migraine episodes in susceptible individuals (Silberstein et al., 2001). Individuals with migraine should be cautioned that missing or delaying meals can also trigger headaches.

The role of caffeine as a potential precipitant may need to be explored if individuals with migraine regularly consume more than 300 milligrams of caffeine a day (approximately the amount found in two strong cups of coffee) because this amount of caffeine may precipitate migraines through the rebound effect or through caffeine sensitivity. Individuals who ingest caffeine during the day may experience caffeine withdrawal at night and thus may be awakened by a migraine at night or first thing in the morning. This does not necessarily imply that caffeine must be completely avoided. Many migraine medications contain caffeine to facilitate absorption of the medication and counteract the drowsiness induced by some medications. Caffeine in medications thus must be included in calculations of caffeine intake. Prospective monitoring may help to determine if caffeine intake or withdrawal are precipitants for a particular patient.

Environmental Factors. People with headaches should be assisted in avoiding or restricting their exposure to various environmental factors they have identified as headache triggers. They also should be alerted to the possible effects of common environmental precipitants (see Table 4). Avoiding and restricting exposure to environmental precipitants can typically be accomplished with little lifestyle disruption.

Effective Use of Migraine Medications

Orientation. We emphasize that effective use of headache medications may involve the application of complex decision rules; thus, making these rules explicit will enable patients to use their medications more effectively. We help the patient develop and effectively apply optimal decision rules to guide the use of symptomatic and abortive medications, as well as relaxation, cognitive, and other

psychological headache management techniques. The goal is both to prevent medication overuse and to maximize the effectiveness of headache medications. In order to assist patients in effectively using migraine medications, the therapist must be knowledgeable about headache medications and work closely with the prescribing physician.

Headache medications. Below is a synopsis of four types of migraine medication. Detailed discussions of these medications can be found in Baumel (1994), Davidoff (1995), Saper, Silberstein, Gordon, and Hamel (1993), and Silberstein, Saper, and Freitag (2001); Holroyd, Lipchik, and Penzien (1998) present guidelines for the integration of medication and behavioral treatment.

Symptomatic medications include analgesics prescribed primarily to reduce pain such as nonsteroidal anti-inflammatory drugs (NSAIDS), mixed analgesics containing barbiturates (e.g., butalbital) or opioids (i.e., codeine), and opioids alone (i.e., oxycodone). Effective symptomatic therapy should reduce pain from mild to none or from moderate to mild within one to two hours. The use of opioid and mixed analgesics must be limited because over-use can cause rebound headaches and even addiction. NSAIDS are probably less likely to induce rebound headaches, but nevertheless should be used in moderation.

Abortive medications include NSAIDS, ergotamine derivatives and serotonin-receptor agonists (triptans such as sumatriptan, rizatriptan, naratriptan, zolmitriptan, and almotriptan). Effective abortive therapy should prevent migraine pain from becoming moderate or severe if taken when pain is mild or reduce severe or moderate pain to mild or no pain within two hours. These agents should be used no more than two to three days per week to avoid rebound headaches.

Antiemetics (e.g., prochlorperazine, metoclopramide) are used to treat the nausea and vomiting associated with migraines. The goal of antiemetic therapy is to reduce nausea within one to two hours and control vomiting most of the time. Antiemetics also improve the absorption of some oral medications, including analgesics and may have anti-migraine effects themselves. Patients who experience nausea and vomiting are instructed to take an antiemetic before or along with their analgesic.

Preventive or prophylactic medications for migraine include beta-blockers, calcium channel blockers, antidepressants (tricyclic, serotonin-reuptake inhibitors, and MAO inhibitors), anticonvulsants, and NSAIDS; antidepressants (for the most part tricyclics) are the primary preventive medications for tension-type headache (Holroyd et al., 1998; Silberstein et al., 2001). The goal of preventive therapy is to reduce the frequency of headaches by 50% or more.

Instruction. The symptomatic and abortive use of medication receives the greatest attention because effective use of these medications may require complex decisions that take into account the limits on the use of the medication, patients' headache symptoms (e.g., do these symptoms predict a moderate to severe migraine?), and previous empirical observations of patients' responses to specific medications. For

example, for one headache sufferer, analgesics, NSAIDS, or a single triptan dose may effectively abort a migraine when taken early in the migraine episode, but the same medication will be much less effective, even in multiple doses, when taken later in a migraine episode. In this case, overall medication use per episode can be reduced and the efficacy of the medication improved by implementing a judicious plan to initiate treatment early. Another person may be unable to confidently predict whether a mild headache will develop into a severe migraine; attempting to initiate treatment early in an episode, the person may not only fail to reduce medication consumption but may be tempted to overuse medications. Thus, effective use of medications in the acute treatment of migraine requires a systematic plan that takes multiple factors into account in each decision to treat. Decision rules also must be refined as the patient collects data by experimenting with different possible treatment options. We assist the patient in formulating decision rules for medication use that are consistent with medical advice and help the patient conduct and evaluate data from “experiments” to test different treatment options.

Responding to Early Warning Signs, & Triggers

Orientation. The information that has been collected about early headache warning signs and headache triggers is now used to develop an action plan that is directed at preventing and managing headaches. The prodromal symptoms and aura symptoms the patient has identified serve as signals to take actions to abort or reduce the severity of the anticipated migraines. Headache triggers provide information that can help the patient take actions to prevent or manage headaches. The goal is to replace the sense of dread, anxiety, and helplessness many individuals feel when anticipating a headache with a sense of self-efficacy and a plan of action.

Instruction. Decisions about effective medication use and about the use of relaxation skills are integrated in an action plan that incorporates this new knowledge about early headache warning signs and headache triggers. For example, specific early warning signs that reliably signal the onset of a migraine may now serve as a cue for a patient to use a triptan medication, apply quick relaxation skills, and limit exposure to possible triggers. This tentative action plan is then further refined on the basis of subsequent experience. We use the RESCUE acronym below to remind patients of general principles underlying the RESCUE plan, but develop a specific plan for each person.

Remain calm. Worrying about how to work around a migraine or denying that it might occur usually makes it more long lasting and severe.

Escape from known triggers. Your body may be more susceptible to triggers during the preheadache (or prodrome) phase. Avoid or minimize triggers wherever possible.

Stay away from stress or stressful situations. Avoid taking on extra work. Let some things go that do not have to be completed right now. Be extra kind to yourself.

Carry your migraine medications with you at all times. Make sure you have quick and easy access to your medications wherever you go. Always be prepared.

Use relaxation exercises. Concentrate on the ones you find most useful. Remember that relaxation may help control some of the physical changes associated with migraine.

Eat and sleep on schedule. This is not the time to skip meals or go without sleep. Do not try to finish everything you think you have to do before the migraine begins.

Cognitive-Behavioral Stress-Management (CBT)

Experience with clinic-based CBT for headache is helpful before attempting to administer CBT in a home-based format. Basic descriptions of CBT can be found in A. Beck and colleagues (1979), Beck and Emery (1985), J. Beck (1995), Greenberger and Padesky (1995), Persons (1989), and the Turk chapter in this volume.

Orientation. We suggest stress-management is an important headache management skill because stress is the most frequently reported headache trigger. For patients who view stress as unrelated to their headaches, we note that the occurrence of a headache itself is stressful. We also may focus on related targets (e.g., anxiety), or with migraine we may skip stress-management (see Table 1). In brief treatment the goal is for patients to acquire a set of basic stress-management skills and sufficient confidence (self-efficacy) in their ability to apply and further develop their rudimentary skills in increasingly difficult situations following treatment.

Stress-management begins with a description of the stress reaction (i.e., physical, emotional, cognitive components), the role of stress in triggering and aggravating headache episodes, and the role of cognition in shaping the stress reaction. The therapist explains that stress reactions have three components: physical (e.g., neck tension, rapid heart rate), emotional (e.g., frustration, anxiety), and cognitive (e.g., worry). Thoughts and beliefs or the cognitive component is central in that it can render the person vulnerable to stress. We explain that stress-generating thoughts have three characteristics. They (1) are automatic (i.e., occur habitually without any conscious effort or awareness), (2) distort the situation or the patient's coping options to some extent, and (3) have a negative emotional and physical impact. We further suggest that stress reactions can be managed with strategies that counteract, challenge, or re-appraise stress-generating thoughts.

To illustrate how thoughts mediate the stress reaction we use generic examples of the way thoughts associated with common stressors (e.g., work demands, social situations, refusing demands, criticism, or headaches themselves) can trigger or magnify a stress reaction. We attempt to use examples that are relevant to the particular patient and to phrase the examples in the patient's own words. Examples begin with identification of a specific stressful situation, preferably one that is associated with headaches for the patient; identification of the emotional, physical, and cognitive components of the stress reaction;

and an analysis of how thoughts shaped the stress reaction. This is most effective when a detailed account of the patient's reactions to stress is obtained from daily diaries than when we rely on a general retrospective reconstruction of the patient's stress reaction (Holroyd & Andrasik, 1982).

To assist patients in observing headache-related stress reactions, patients are asked to complete thought monitoring forms similar to those used in CBT (Beck et al., 1979; Greenberger & Padesky, 1995). These stress analysis worksheets require patients to identify stressful situations and their thoughts and feelings during the stressful situation. Completion of these worksheets helps patients observe relationships between cognitions, emotions, and physical reactions. The worksheets also provide the therapist with valuable information about the patient's current coping skills (or lack thereof).

Instruction. We use two general approaches to *cognitive restructuring*. Self-talk strategies (Meichenbaum, 1977) may help patients control situation specific stress-generating thoughts (e.g., "I'll never meet my sales goal by the end of the month."). Strategies for identifying and challenging the beliefs or assumptions that underlie stress-generating thoughts ("If I don't meet my sales goal I'm a failure.") help patients control a class of stress-generating thoughts that appear in different guises across similar stressful situations. The first step in applying either of these cognitive restructuring approaches is to identify a stressor and a cognitive target.

Identifying a Stressor and Cognitive Target. Reviewing information from the patient's stress analysis worksheets, we generate a list of stressful situations, emphasizing stressors that are associated with headaches. The patient will typically identify several stressful situations. We choose a stressor that we believe can be addressed in brief treatment.

Once an appropriate stressful situation has been identified we proceed to the collaborative identification of a cognitive target; that is, we choose the stress-related cognitions that will be the focus of the session. The targeted cognitions may be stress-generating *thoughts* associated with a specific situation or an underlying *belief* or assumption that distills the common meaning or theme from many stress-generating thoughts. For example, a patient who reported experiencing frequent headaches in response to new sales goals that she feared she was unable to meet recorded the thought "I have let the company down (by not meeting this month's sales goal)". This thought appeared (on the basis of other evidence) to be related to the belief that "If I fail to meet this goal or make a mistake, I am a failure."

Stress-generating beliefs commonly reflect perfectionism, excessive need for approval, and excessive need for control. To identify beliefs look for a theme that explain a pattern of stress reactions exhibited by the patient; that is, the situations the patient finds stressful and the patient's thoughts, emotions, and behavior in these stressful situations.

Stress-generating thoughts and behaviors occurring in the treatment session itself provide special therapeutic insight and leverage because the patient's behavior can be observed directly, rather than

inferred from patient report and diary recordings. For example, when a patient describes stressful situations that appear to be associated with nonassertive behavior, we might ask ourselves: “Does this patient’s timidity and self-critical posture with me provide information about the stressful situation she describes at work? Might her boss continue to add to her responsibilities because she never protests or gives a clear indication she is distressed by this? Has she reported thoughts that might further explain her inability to refuse new demands? Has she refused a homework assignment, disagreed with me, or shown other sparks of independence in therapy?” If the answer to this final question is no, we might ask ourselves “Is this a good point to obtain the patient’s input before I proceed with this hypothesis?” If the answer is yes, we might think “What enabled her to show this independence here (but not at work) that we might capitalize on in managing stress at work?” Once a cognitive target is identified, it is important to make an explicit agreement with the patient that this cognitive target will be the focus of the session.

Challenging Stress-Generating Thoughts. When the identified cognitive target involves stress-generating thoughts, adaptive coping statements can be generated to interrupt the flow of these thoughts. Methods of challenging stress-generating thoughts might include the evaluation of evidence for the stress-generating thought: “Let’s see what evidence we can find for (the statement implicit or explicit in the stress-generating thought)”. We then assist the patient in finding both confirming and disconfirming evidence for this thought and in weighing the evidence. It is important that the therapist adopt an inquiring stance and remain open to any outcome, including the confirmation of the stress-generating thought. Verbal challenges may proceed to the generation of alternative adaptive coping statements. For example, to manage the thought “I’ll never meet my sales goal by the end of the month,” adaptive coping statements might include statements such as “At this time, there is no way to tell how far I’ll get this month. Instead I’ll focus on the task at hand and I’ll see how far I get” and “I’ll focus on what I can do; if I need to, I’ll find a way to work toward meeting my goal next month.” Coping self-statements are best developed collaboratively so the patient is not a passive recipient of a prepackaged coping statement. The act of collaboratively formulating coping statements that feel “right” or “potent” may be more therapeutic than the exact coping statement that results from this exercise. A useful coping statement is typically stated in the patient’s own words and framed within the patient’s belief system so that it undermines problematic beliefs “from within.” Adaptive coping statements can be particularly helpful in short circuiting stress-generating thoughts that occur in reaction to specific, circumscribed, and time limited stressors.

Challenging Stress-generating Beliefs. When the identified cognitive target involves a stress-generating belief, the patient may be pushed to examine it. Stress-generating beliefs can be challenged in much the same way as stress-generating thoughts. Other techniques for working with stress-generating beliefs include decatastrophizing or the “what if” technique, and cost and benefit analysis (see Beck &

Emery, 1985). For example, perfectionistic beliefs such as “I must never make a mistake, or I am a failure” are often defended on the grounds that they are necessary for high achievement. However, when the costs as well as the benefits of this belief are listed it can highlight costs such as time devoted to unimportant tasks (they need to be done perfectly), anxiety (“I might fail”) and frustration (“I have to do better”) in achievement situations, and avoidance of opportunities (exploring new opportunities requires a tolerance for initial failure).

Alternative views techniques that encourage the patient to generate alternative explanations for events that confirm a stress-generating belief can be particularly helpful. The patient might be asked “What might Ann (a respected friend, relative or co-worker) think if you refused this new responsibility?” or “What would you say to Ann if she was asked to do this and declined with the explanation that her workload was full?” It can be helpful in working with alternative views to reverse roles with the patient, where the therapist plays the patient, adopting and defending the patient’s belief system, while the patient plays the therapist, attempting to challenge the targeted dysfunctional belief. For example, the woman described above who failed to meet the sales goal for one month might be asked, “What would you say to a colleague who failed to meet the sales goal?” or “What would think about a colleague if he or she didn’t meet this goal?”

All CBT sessions culminate in a homework assignment that is designed to continue or extend the work done in the session. Homework assignments that are developed collaboratively and incorporate input from the patient are most likely to be carried out. Typical homework tasks include engaging in a specific behavior that is avoided because of a stress-generating belief; asking a significant other what he or she would think of this behavior; or collection of additional diary data on thoughts, feelings and behaviors in stressful situations. For example, a patient who believes “I must be perfect, never make a mistake, or I am a failure” might be asked to intentionally make a small mistake and carefully record the consequences. Alternatively, the patient might inquire of coworkers (or family members, if more appropriate) how they would feel and think about the patient if the patient made a specific feared mistake.

Problem-solving. Problem-solving focuses directly on actions that can be taken to alter the stressful situation. Problem-solving guides patients through the steps of identifying the problem, generating possible coping strategies, choosing a preferred coping strategy, and implementing and evaluating the chosen coping strategy (D’Zurilla, 1989, 1990). As was noted above, the problem or stressful situation should be one that is likely to be manageable in brief treatment. In describing the problem we limit the description to a well-defined circumscribed situation and include only the facts and not one’s own appraisal of the problem (e.g., “Forty-five minutes before my work day ended I was handed five new tasks,” instead of “At the last possible moment I was handed an impossible number of tasks that I’m expected to get all done before I leave.”). In generating possible solutions, the focus is on

brainstorming to generate as many possible coping strategies as possible. The goal is to move patients beyond the mode of considering a single problematic coping strategy. Choosing a coping strategy often involves cognitive restructuring, as beliefs that restrict the choice of options the patient considers (e.g., “The only choice I have is to stay here until all the tasks are completed”) need to be challenged. In selecting a coping strategy, we focus on a solution that is viable, can be implemented before the next treatment contact (phone contact or clinic visit), and is likely to have an impact on the stressful situation (e.g., “I can talk to my supervisor about how I can prioritize the tasks I have in the time I have remaining” vs. “I have to quit and start looking for a new job”). Frequently the chosen coping strategy requires that the patient engage in a previously avoided behavior. Once a coping strategy is chosen we may discuss problems likely to be encountered in executing the coping strategy and role-play its execution.

Problems commonly encountered during cognitive-behavioral stress-management, and possible therapeutic responses are presented in Table 5.

Insert Table 5 about here

Thermal Biofeedback

Orientation. Thermal biofeedback was initially identified as a treatment for migraine 30 years ago at the Menninger Foundation (Sargent, Green, & Walters, 1972). Although the exact mechanism of thermal biofeedback is not well understood, the voluntary hand-warming response appears to induce changes in vascular activity and that can prevent or abort migraines. Like relaxation training, thermal biofeedback is a preventive strategy, not an acute intervention. In order to maximize its preventive effects daily practice is important. Additional information about the use of thermal biofeedback in the treatment of migraine can be found in Holroyd, Lipchik and Penzien (1998), Blanchard and Andrasik (1985) and in the Arena and Blanchard chapter in this volume.

Instruction. The goal is to teach patients to warm their hands through volitional peripheral vasodilation with the assistance of sensory feedback. Thermal biofeedback involves the use of a temperature-sensitive probe (a thermistor) and an electronic device that converts the temperature signal to a feedback display, which is typically visual, but may be auditory. We usually place the thermistor on the ventral pad of the last digit of the index finger. We use medical tape to hold the thermistor in close contact with skin, but avoid encircling the finger completely as it is important to avoid creation of a tourniquet. We keep the room relatively warm (around 75° F) because it is difficult to warm one’s hands in a cool room. For MTCT biofeedback, we give patients a small digital biofeedback device sensitive to 0.1° F with a screen that updates every 2 sec. (Bio-Medical Instruments, Inc; www.bio-medical.com,

available for less than \$20). More sensitive and quickly responding instruments can be obtained at a somewhat higher cost, and crude alcohol-in-glass thermometers can be obtained for 50 cents.

It is important for patients to develop a sense of internal control over the hand-warming response. We encourage patients to experiment with a variety of hand-warming techniques. For example, we suggest they experiment with both imagery (e.g., warming hands before a fire), sensory (e.g., focus on physical sensations that accompany handwarming), and verbal (e.g., autogenic phrases) techniques. We ask patients to practice between 10 to 20 minutes twice daily.

Pain Management

Orientation. The same relaxation and stress-management skills that are used to prevent headaches can also be used during headache episodes to manage the pain associated with the headache. We review the use of quick relaxation skills during a headache episode and instruct patients in additional pain management techniques including attention control or attention-diversion strategies, additional guided imagery, pain transformation, and the application of CBT to catastrophizing thoughts triggered by the anticipation of a headache episode. The reader unfamiliar with attention control, guided imagery, and pain transformation is referred to Martin (1993), Philips and Rachman (1996), and the Syrjala and Abrams chapter in this volume.

Instruction. A brief description of pain management techniques is provided below.

Attention control or attention-diversion. Concentrating on an undemanding mental task for a brief period of time may help to shift attention away from pain. The task should be neutral, repetitive, or pleasant. Some examples include singing or reciting words to a favorite song, making a mental list of plans for an upcoming holiday or event, or mental arithmetic.

Pain Transformation. Pain transformation involves mentally modifying the characteristics of the pain sensation so that these sensations become less aversive. It is important that the image fit the pain. For example, if head pain is experienced “as if my head is in a vise”, patients may imagine the vise loosening, or the vise disintegrating. Patients who report prominent muscle tightness or muscle pain with their headaches may imagine tight muscles as a rope tied in knots, then imagine the knotted rope unwind and go limp, with tension leaving the muscles as they unwind.

Application of CBT to Headache Episodes. Cognitive-behavioral stress management skills can be especially helpful for patients who experience anxiety when anticipating their headaches, or for patients who experience high levels of affective distress in response to their headaches. CBT can help patients identify and modify thoughts that occur as a headache begins or in anticipation of a headache. For example, common stress-generating thoughts include “These headaches are never going to go away” or “This headache will make it impossible to do anything today.” Coping statements that reflect a more balanced appraisal, including

thoughts such as “I am learning many things that I can do to cope with this headache” or “I can still get something done even when I have a headache” can be of help to some patients.

Maintenance of Self-Management

Orientation. The goal of treatment is long-term headache management. We explain to patients that further improvement or even the maintenance of current improvements probably will require continued effort. Patients are encouraged to continue to incorporate headache management skills into their daily routine as well as to be on the lookout for the lapses in behavior that can lead to problems in headache control. We reassure patients that the continued practice of headache management skills will require less time and effort than was required when they were learning the skills.

Instruction. MTCT provides only an introduction to headache management skills; therefore we plan what the patient will work on when clinic contacts end, and identify events likely to cause a reoccurrence or worsening of headaches. We help patients identify obstacles to effective self-management and develop plans for coping with these obstacles. We assist patients in identifying behaviors (such as increased use of medications, sleep difficulties, ineffective coping with stress) in addition to an increase in headache activity that might suggest they are off track with their headache management program, and discuss how to handle such temporary setbacks. Lastly, we remind patients that life is full of challenges, and they might need an occasional “checkup” or booster session.

DISCUSSION

We presented a brief clinical guide for the MTCT of migraine and tension-type headache addressing, where possible, clinical issues that are likely to confront therapists. MTCT formats can reduce the cost and increase the availability of behavioral treatment, and reduce barriers to the integration of behavioral treatments into the medical setting. MTCT formats and other recent innovations in the delivery of behavioral treatments for headache (Holroyd, in press) have the potential to improve the dissemination of behavioral treatments into the healthcare system. The last two decades have seen the emergence of empirically supported psychological treatments for a number of pain disorders, but these treatments are rarely available in the medical settings where most patients are seen. Hopefully, in the next decade we will see not only continued progress in the development and evaluation of behavioral treatments, but also the effective dissemination of these treatments into the health care system where they can benefit greater numbers of patients.

FOOTNOTES

ⁱ American Academy of Family Physicians, American Academy of Neurology, American Headache Society, American College of Emergency Physicians, American College of Physicians, American Osteopathic Association & National Headache Foundation.

ⁱⁱ Previously the Agency for Health Care Policy and Research

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Table 1. The Structure of Minimal-Therapist-Contact Treatment*

wk		<i>Tension-type Headache**</i>	<i>Migraine</i>
1	1st Clinic Visit (50-60 minutes)	Orientation to self-management. Explanation of treatment. Introduction of progressive muscle relaxation, deep breathing, muscle stretches, imagery.	Same Same Same
2	No contact	Brief forms of relaxation.	Same Begin monitoring of migraine triggers/ warning signs
3	Phone consultation (15 minutes)	Address difficulties with home practice. Preview cue-controlled relaxation, relaxation by recall, autogenic phrases. Begin monitoring headache-related stressors.	Same Same
4	No Contact	Application of quick relaxation skills to daily activities. Begin monitoring headache-related stressors.	Same
5	2nd Clinic Visit (50-60 minutes)	Continue to refine relaxation skills if necessary. ---- Identify headache-related stressors. Introduce stress management (cognitive coping or problem solving) strategies.	Same Identify headache triggers & warning signs. Effective use of migraine medications. Develop RESCUE plan for responding to warning signs & migraines
6	No Contact	Apply & refine stress management techniques.	Apply & refine RESCUE plan. Review pain management.
7	Phone consultation (15 minutes)	Address problems & refine application of stress- management techniques.	Address problems & refine RESCUE plan.
8	No contact	Continue application of stress management.	Continue with RESCUE plan incorporating pain management skills. Preview choice of activity for 3ed treatment session.
9	3rd Clinic Visit (50-60 minutes)	Continue stress-management, including alternate (cognitive coping or problems solving) strategy as needed. Introduce pain management strategies.	Chosen activity is focus of this session: (1) refine skills already learned, (2) stress- management, or (3) thermal biofeedback. Previous modules reviewed or new module introduced accordingly.
10	No Contact	Incorporate stress management skills into daily activities.	Practice chosen activity.
11	Phone consultation (15 minutes)	Address difficulties in application of stress management skills.	Address difficulties in application of chosen skills.
12	No Contact	Apply & evaluate preferred headache management skills.	Same
13	4th Clinic Visit	Identify most useful headache management	Same

(50-60 minutes) skills for this patient.
Develop headache management plan including coping with anticipated problems following treatment. Same

* Health care professionals may request a copy of the patient manuals and audiotapes that accompany these minimal-contact treatment protocols at cost from Kenneth A. Holroyd.

**Evaluations of this treatment (e.g., Holroyd et al., 2001) examined a version of this treatment with 3, rather than 4 clinic visits.

Table 2. Relaxed Behaviors Based on Poppen's Behavioral Relaxation Scale

1. Head: supported by chair; head not tilted; nose in midline of the body, no motion
 2. Eyes: eyelids lightly closed with smooth appearance; no motion under eyelids
 3. Mouth: lips parted slightly at the center of the mouth; front teeth slightly parted; no tongue movement
 4. Throat: no motion (e.g., swallowing, other larynx action, twitches)
 5. Shoulders: slightly rounded, transect same horizontal plane and rest against chair; no motion
 6. Body: torso, hips, legs are symmetrical around midline and resting on chair; no Movement
 7. Hands: resting on armrest or lap with palms down and fingers slightly curled in a clawlike fashion
 8. Feet: pointed away from each other at a 60 to 90 degree angle; feet not crossed at ankle; no movement
 9. Quiet: no vocalizations or loud respiratory sounds (no talking, sighing, laughing, gasping, coughing)
 10. Breathing: breath frequency less than observed at beginning of session; no breathing irregularities that interrupt the regular rhythm of breathing (e.g., coughing, sneezing, yawning).
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Based on Poppen (1988)

Table 3. Relaxation Training: Problems and Solutions

Problems	Solutions
A. Patient's Attitude	
1. Patient is self-critical or hesitant during training.	Identify self-critical thoughts and help patient to challenge them. Offer reassurance.
2. Patient is overly concerned about performance.	Suggest trying hard is counterproductive; instruct in alternative attitude of passive volition.
3. Patient is hesitant to relinquish control.	Discuss fears about loss of control; explain that novelty of sensations of relaxation may be triggering anxiety.
B. Learning the Skill	
1. Patient's concentration is disturbed by distracting thoughts or feelings. This is most common problem; may want to discuss with patient prior to practice.	Encourage patient to <i>not</i> fight these thoughts, but let them pass through mind. Remind patient these will lessen as they get better at relaxation. Use imagery techniques (e.g., placing interfering thoughts in an imaginary trunk, thoughts floating by on clouds) or autogenic phrases (e.g., peaceful, calm) to focus attention. If they continue, and are severe, try thought stopping.
2. Patient falls asleep when practicing relaxation	Do not schedule relaxation practice just after meals or just before bedtime. Practice seated rather than lying down.
3. Patient has difficulty detecting difference between sensations of tension and relaxation.	Have patient place one hand on muscle while tensing vs relaxing muscle. Introduce alternate tensing techniques. Use partial tensing of muscles (discrimination training) to help patient identify subtle cues of tension and relaxation.
4. Certain muscles are difficult to relax.	Repeat tensing-relaxing sequence with specific muscles; use muscle stretching exercises prior to relaxation practice.
C. Maintenance and Generalization	
1. Patient reports no carry-over effect after relaxation.	Introduce brief cue-controlled relaxation techniques to use periodically throughout the day. Identify thoughts or situations that evoke arousal.
2. Patient has difficulty detecting difference between sensations of tension & relaxation in daily situations.	Ask patient to discuss a recently stressful situation, note any muscle tension, such as clenched jaws or fists, furrowed brows, tightened shoulders.

Table 4. Precipitating Factors for Headache Identified by Patients

Lifestyle factors:

Fatigue

Inconsistent eating patterns:

Fasting

Missing meals

Insufficient food

Sleep

Excessive sleep

Unrefreshing sleep

Insufficient sleep

Change in sleep schedule

Sleep problems (i.e., delayed onset, restless sleep)

Stress:

During stress

After stress (i.e., "let down headache")

Travel

Smoking or passive smoke

Specific foods:

Aged cheese

Alcoholic beverages

Artificial sweeteners (i.e., aspartame)

Beans

Caffeine (coffee, tea, cola)

Chocolate

Citrus fruit

Cured meats

Fish

Monosodium glutamate

Nuts

Yeast

Hormonal and physical factors:

Head or neck injury

Hormone replacement therapy

Medications

Menstrual period (before, during, after)

Oral contraceptives

Physical exertion

Post-menopausal changes

Pregnancy

Environment:

- Altitude changes
- Air pollution
- Bright or flickering lights, glare
- Exposure to vapors or chemicals (i.e., gasoline, industrial fumes, cleaning products)
- Motion
- Noise
- Perfumes, colognes
- Smoke
- Strong odors
- Weather changes (i.e., barometric changes)

Information from Blau & Thavaplan, 1988; Radnitz, 1990; Rasmussen, 1993; Robbins (1994).

Table 5: Cognitive-Behavioral Stress-Management Therapy: Problems and Solutions*

Problems	Solutions
A. Treatment Rationale	
1. Patient does not see her/his behavior as influencing stress responses or headaches.	Use personal examples to illustrate how cognitions influence stress responses. Review rationale using concrete examples.
B. Monitoring Stress & Identifying a Target Problem	
1. Patient presents a large number of stressful situations.	Be alert to common themes that cut across multiple problems. List problems from largest to smallest. Choose manageable problem as an initial focus. Structure session to maintain focus on a selected problem.
2. Headaches are not clearly stress-related, or patient unable to identify stress-related thoughts.	Review headache records and analyze situations associated with headache. First, use physical cues, stressful events associated with headaches to recognize onset of episode, then identify concrete thoughts present prior to onset. Use events that occur in therapy as opportunity to identify automatic thoughts occurring in the “here and now.”
3. Headache always present.	Identify factors associated with exacerbation rather than onset of headache. Consider focusing on potential aggravating factors (e.g., chronic stress, depression, anxiety or worry, lack of sleep).
4. Patient’s and therapist’s preferred target problem differ.	Openly discuss difference of opinion; defer to patient if patient’s preference strongly held.
C Coping Skills Training & Application	
1. Patient does not attempt, or attempts but “fails” homework assignment.	Examine patient’s thoughts about homework assignment for clues to maladaptive thoughts/beliefs. Frame assignments as opportunity to learn. Break assignment into easier tasks. Change homework assignment (focus) if necessary.
2. Patient believes external pressures prevent change (e.g., inflexibility in job situation).	Be alert to thoughts or beliefs that prevent patient from seeing alternatives. Experiment with small change (e.g., muscle stretching during bathroom break). Discuss persons who the patient identifies as effective copers for models of feasible change. Brainstorm without requiring that alternatives generated be perceived as feasible.
3. Maladaptive thoughts seem self-evidently true to patient.	Offer variety of alternative explanations of same “facts”. Evaluate the evidence for and against maladaptive appraisals. Reverse roles with patient.

4. Friction or difficulties in
therapeutic alliance.

Openly discuss conflict. Be alert to possibility that difficulty
provides information about patients coping. Admit errors.

*Based on Holroyd, Lipchik, & Penzien (1998)