

Assessment and Treatment of Chronic Headaches in Adolescents

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INTRODUCTION

The occasional headache is common among individuals of all ages and is typically managed independently and successfully. Severe recurrent headaches, however, can interfere with daily activities and severely limit an adolescent's ability to function in his or her life. Until recently, research regarding etiology, related factors, and treatment of persistent headaches was largely conducted with adults, with pediatric practices extrapolated from adult findings. In the last decade, however, there has been a surge in the study of chronic pain in adolescents, including chronic headache (P. J. Norton et al., 1999). This research has continued to demonstrate the often serious and impairing nature of chronic headache as well as the effectiveness of biobehavioral interventions.

Incidence and Impact

Headaches are common in children, adolescents, and adults, although exact incidence is difficult to verify due to limitations in diagnostic categorization. Recent studies have supported the incidence of frequent nonmigrainous headache in the child and adolescent population as approximately 2.5% (Newacheck & Taylor, 1992), with an increased incidence with age (Egger, Angold, & Costello, 1998). By age 13, 82% of teens have reported some form of headache in their previous 12 months, and 14% to 17% of adolescents report some degree of recurrent headache (Sillanpaa, 1983). The incidence of childhood migraine also increases with age, with a preadolescent rate of 3% (Abu-Arefeh & Russell, 1995; Sillanpaa, 1983) and adolescent rates ranging from 7% to 11% (Prensky & Sommer, 1979; Sillanpaa, 1983). New cases of migraine in boys peak in preadolescence and, in girls, in mid to late adolescence (Stang et al., 1992).

Approximately 1% of all school days missed appears to be related to headache pain (Collin, Hockaday, & Waters, 1985), and several hundred thousand school days are estimated to be missed each month due to pediatric migraine (Stang & Osterhaus, 1993). Including all headache types, more boys than girls experience headache in the preschool to early elementary school years. By early adolescence, the incidence has shifted, with a greater number of girls than boys reporting headache (Abu-Arefeh & Russell, 1995; Bille, 1962; Mortimer, Kay, & Jaron, 1992; Sillanpaa, 1983).

Classification and Diagnosis

Lack of diagnostic reliability and validity has created problems with outcome measurement and limits the generalizability of results of treatment research. Historically, headaches have been classified as either migraine or tension-type based upon the presence or absence of autonomic nervous system symptoms and the quality of the pain, regardless of the age of the patient (Ad Hoc Committee on the Classification of Headache, 1962). Modifications to these criteria that considered the different presentation of pediatric headache improved diagnostic sensitivity and specificity but have not been uniformly accepted (Gladstein et al., 1993). Unfortunately, the recent criteria introduced by the Headache Classification Committee of the In-

ternational Headache Society (1988) were created without consideration of the pediatric population. Recommendations to improve the utility of this system with the youth population have been suggested, including altering criteria for headache duration and number of autonomic nervous system symptoms required for migraine diagnosis (Gladstein et al., 1993; Maytal et al., 1997).

Headaches can be classified along dichotomous variables of incidence (acute or recurrent) and course (progressive or nonprogressive) (see Table 1 below). Headaches that become progressively more severe over time (whether acute or recurrent) should be considered suspicious for some type of organicity, either infectious or neoplastic, and require complete medical evaluation. Nonprogressive headaches may be acute in course, as with migraine or tension headache, or recurrent, as with chronic daily headache (also called chronic nonprogressive or recurrent daily headache). A "mixed headache" condition includes a combination of intermittent migraine and chronic headache. Although the Headache Classification Committee of the International Headache Society (1988) also utilizes the category of cluster headaches, these are relatively rare in childhood and adolescence and will not be discussed further here.

TABLE 1: Classification of Headaches by Incidence and Course

	Progressive	Nonprogressive
Acute	Suspect organicity Refer for medical evaluation	Tension or migraine
Recurrent	Suspect organicity Refer for medical evaluation	Chronic recurrent (chronic daily)

Migraine headaches are distinct from other headaches in their physiologic mechanism, frequency, and presentation. They are associated with a variety of autonomic system prodromal symptoms (an aura), including nausea, vomiting, phonophobia, photophobia, and/or other visual disturbances. A number of triggers are associated with migraines, including changes in temperature, weather, bright lights, and hormones, and there is a strong hereditary component. Stress and distress have also been associated with precipitation, exacerbation, or maintenance of migraine (Carlsson, Larsson, & Mark, 1996).

Chronic daily headache is a less well-understood disorder. Such headaches may occur several times per week or be present continuously, possibly lasting days to months. The symptom pattern may continue for many years. Chronic headaches can easily be distinguished from migraines by intensity, duration, and presence or absence of related symptoms, even when both occur in the same patient, as in those with mixed headache. In practice, patients presenting with chronic headache, particularly of greater than 6 months duration, seem to share many social and behavioral features. Many appear to maintain high academic standards and have a history of academic and vocational successes, have strict expectations regarding behavior of self and others, and establish a greater than typical degree of distance from others socially. Such observations do not indicate etiology but, rather, suggest relationships among various factors and pain presentations that must be explored in planning treatment.

Observations of patterns of behavior and symptoms among patients has led to the conceptualization of chronic headaches as a somatoform disorder (*Diagnostic and Statistical Manual of Mental Disorders [DSM-IV]*, American Psychiatric Association [APA], 1994). This provides a framework for understanding the complex set of symptoms that are associated with pediatric headache and leads logically to effective treatment planning. Attention is drawn away from etiology and toward the reaching of functional goals, including decreasing distress and increasing day-to-day activities. For all diagnoses within the somatoform category, it is important for the clinician to understand (and communicate to the patient and family) that the

pain symptoms are not intentional but, rather, psychological factors may play a complex role in the development, maintenance, and/or resolution of the pain.

Etiology, Related Factors, and Comorbidity

Although the etiology of recurrent headache in either children or adults is not entirely understood, research with adults has suggested a genetic component, stronger for women than men, for both tension and migraine headaches (Honkasalo et al., 1995; Larsson, Bille, & Pederson, 1995). There may be an inherited headache predisposition, which may be triggered by a variety of biological (e.g., puberty) or psychosocial (e.g., stress) factors, with individual headache course moderated by multiple individual difference variables (e.g., personality and coping style).

Multiple familial factors appear to predict an increased likelihood of pediatric headache. Gulhati and Minty (1998) found that parents of children with headache, particularly mothers, were more likely than controls to report extensive childhood and adulthood illness histories. Mothers of children with headache were also more likely to report the loss of their own mothers due to death, express feelings of loneliness, and express concerns about serious disease in themselves with reluctance to accept medical reassurance.

Among children, Aromaa et al. (1998) found that a number of factors appear to predict an increased likelihood of chronic headaches at age 6, including global health or feeding problems in infancy or sleep difficulties or depressive symptomatology at age 3. Children with behavioral problems, increased fatigue, and concentration difficulties at age 5 are also more likely to experience persistent headaches at age 6, as are those who were considered highly social. Adolescents with headache often report school stresses and social difficulties and have a greater number of school absences than controls (Metsahonkala, Sillanpaa, & Tuominen, 1998). In clinical practice, there appears to be a relationship among parental expectations, social adjustment, peer pressure, and recurrent headache. Some adolescents with recurrent headache, including both males and females, seem to hold high standards for self and others, may be somewhat socially naïve, and have difficulty tolerating other opinions and views. Parents tend to report these teens as exceptionally "good" children, often excelling in academics, engaging in no behavioral difficulties, and generally well mannered and well behaved (Jensen et al., 1998).

Well-designed epidemiological studies of adults with headaches have demonstrated a common coexistence of depression or anxiety. An association between migraine and depression has been shown in women (Morrison & Price, 1989) and between panic disorder and migraine (Stewart, Breslau, & Keck, 1994). Among children and adolescents, there have been a number of clinical studies and a few epidemiological studies of headache and psychopathology, although most have been methodologically flawed, using nonvalidated measures of psychiatric symptoms. Pine, Cohen, and Brook (1996), using validated diagnostic criteria, found that headaches were twice as common in depressed adolescents as in their nondepressed peers. Comorbidity has been reported between migraine headaches and depression or anxiety in children and adolescents (Guidetti et al., 1998). Egger et al. (1998) found an association between headaches and internalizing disorders specific to girls: Girls who met *Diagnostic and Statistical Manual of Mental Disorders (3rd ed. rev.) (DSM-III-R; APA, 1987)* criteria for a depressive disorder had a four times higher prevalence of headaches than did girls who were not depressed. Additionally, girls with an anxiety disorder had a three times higher prevalence of headaches than their nonanxious female peers. Egger et al. further found that boys who met criteria for conduct disorder experienced twice as many headaches as boys without conduct disorder.

ASSESSMENT

The assessment of patients with recurrent headaches takes on a particular tone because of the patient's frequently intense belief that the symptoms are not psychological. Patients (and their families) referred for evaluation and treatment of headaches are often quite clear in their impression that their headaches represent a physiological problem that cannot be addressed

via psychological treatment. For this reason the orientation of the examiner to headaches (and pain disorders in general) must be well communicated to the patient and family at the start, as a means of gaining trust and establishing a common goal. From this perspective, the purpose of the evaluation is to assess current functioning and concerns and to shift the perspective of the patient and family from a strictly medical to a psychological/habit focus. At that time, a workable treatment plan can be developed. The core components of the assessment process are interviews with the patient and parent(s) and review of history and records, although standardized psychological testing may also be utilized, based upon the clinical situation.

Interviews

Clinical interviews are invaluable in understanding headache pain as perceived by the patient and family. Variables such as the age of the patient, chronicity of symptoms, and type of headache must be considered. The patient who has seen many different professionals for his or her pain and found each lacking presents a different clinical picture (and different treatment issues) when compared to the patient who is just entering his or her first attempt at symptom relief. As well, treatment issues will be slightly different for the patient with moderate level recurrent pain versus the patient with a severe incapacitating migraine every 2 weeks coupled with mild daily headache. Regardless of type, it is generally more effective to begin the evaluation by focusing on more concrete, pain-related, and medical information, gradually moving toward exploration of the impact of the pain and behaviors surrounding the pain (precipitating factors and reactions), and finally exploring more personal issues of social, emotional, and family functioning.

Throughout the initial interviews, the clinician will also be able to acquire information regarding the patient and family that are not necessarily directly questioned, such as the family's attitude toward health and illness, their views of health care professionals, and the role of thoughts, feelings, and behaviors in pain symptoms. Parent response to patient symptoms and complaints (even during the office visit) add to the data set. Issues of secondary gain and inadvertent reinforcement of symptoms may be played out in the office evaluation. Overall, particular attention should be given to the patient and family orientation toward illness versus health, individual and family attitude toward achievement and success, the adolescent's general development and the family's response to this, signs of family stress or conflict, and family interaction.

Initially, the patient and parents are seen jointly, at least briefly, with the goal of clarifying the purpose and process of the assessment and finding a common ground to enlist the involvement of the patient and parents as a part of the "treatment team." This arrangement also permits observation of interactions between parents and the adolescent. The family may need to be frequently reassured, directly and indirectly, that the pain is indeed real and that no one doubts the patient's distress. Still, the availability of psychological and behavioral strategies that can assist in managing and/or decreasing the patient's pain must be continually communicated.

Next, the parents are generally met with privately. The parent interview can follow a structured or semistructured format, depending upon the preference of the examiner. The more structured the format, the more comfortable the parents generally tend to be and the less defensive they may be regarding their child's complaints. There are a number of structured interviews available that are frequently utilized in assessing pain and pain disorders among both children and adolescents, including the Pediatric Pain Questionnaire (PPQ; Tesler et al., 1983) and the Varni-Thompson Pediatric Pain Questionnaire (VTPPQ; Varni, Thompson, & Hanson, 1987), both of which assess sensory, affective, and evaluative dimensions of chronic pain. Regardless of whether a structured or semistructured format is utilized, however, the principal areas necessary to assess are situational, familial, and emotional factors relevant to the pain, as well as sensory dimensions of the pain. In practices where chronic pain represents a large portion of referrals, such a system allows for systematic collection of data and comparisons across patients. The majority of office-based clinicians will likely follow a less-structured process, similar to that used with other patients. In this situation, the clinician must take care to keep the pain and pain issues central in order to keep rapport with the patient and family. Components of the interview should include a specific history of the pain and sur-

rounding variables, an assessment of the impact of the pain on the patient and family, information on any previous attempts at treatment (medical and behavioral), history of similar complaints in the patient or family members, and a thorough developmental history (including academic, psychosocial, and family functioning). The interview should also provide some indication of the parents' response to the symptoms, including a "moment to moment" recollection of "what happens" when the patient reports significant pain. An underlying, although often not spoken, purpose in this historical review with the parents is to identify any comorbid psychological difficulties in the patient or family.

The patient portion of the interview allows for further rapport building and identification of issues that may not have been raised by the patient in the presence of parents, or by the parents alone. Typically, discussion of "factual" information is a helpful entrée, unless the patient has already expressed concerns about or interest in psychological issues. History should minimally include information regarding school (including academic, extracurricular, and social activities), other activities (sports, community, religious, and/or social), family relationships, and general emotional state. Assessing the adolescent's understanding of the medical aspects of his or her pain may be useful, querying specifics regarding the symptoms and obtaining a thorough pain history and timeline. A "moment to moment" recall of events surrounding an episode of pain is again useful, using a "What happens then?" model, which can show the impact of the pain on routine daily functioning. Open-ended questions may be difficult for some patients who are less than pleased with being at the appointment, and a "checklist" approach can be useful. Such lists can be used in assessing what patients have tried for relief of pain (e.g., closing your eyes, going to a dark room, eating/drinking certain things, thinking certain things, talking to someone, taking specific medications, doing things to distract yourself, etc.). With this nonchallenging approach, the clinician gains credibility, which may move the patient toward a more problem-solving view that is more open to attempting behavioral or psychological interventions.

Psychological Testing

In most clinical settings, the individual and parental interviews, along with supporting data from records, will provide the core assessment of patients with chronic headaches. Screening for other behavioral and/or psychological difficulties is recommended through a broad-band rating scale. At times, self-report measures of specific symptoms, such as anxiety and depression, can quantify information obtained by history. In practice, formal psychological testing and assessment is not typically necessary or feasible for "routine" cases. However, if the interview or history raises questions of significant comorbid psychological disorders or if treatment is not progressing as expected, formal assessment of personality, psychopathology, or specific symptomatology may be helpful.

Broad-band behavior rating scales that are completed by the patient, parents, and/or teachers, such as the Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) or the Child Behavior Checklist (CBCL; Achenbach, 1991), are useful for screening. These measures allow for rapid review of a range of behavioral and psychological symptoms and provide information on the perceptions of multiple informants. Symptom-specific measures, such as the Children's Depression Inventory (CDI; Kovacs, 1992) or the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985), can add information regarding the patient's perception of severity of psychological symptoms, although results should be viewed with caution. Such self-report rating scales maintain a high degree of face validity (starting with their names), and patients may view the questionnaire as evidence that the clinician thinks the pain is "not real" but, rather, is the result of anxiety or depression. Additionally, many patients appear unable or unwilling to openly endorse symptoms of psychological distress.

For patients who have not been successful in previous attempts at treatment or in those with clear comorbid symptoms, detailed diagnostic evaluation may be beneficial. General measures of psychological functioning, such as the MMPI-Adolescent (MMPI-A; Butcher & Williams, 1989) and the Personality Inventory for Children-Revised (PIC-R; Lachar, 1981), have been used with this population. Recent research on the MMPI-A has been generally consistent with earlier data with adults, finding that adolescent headache patients, as a group,

show elevations on the Hypochondriasis, Depression, and/or Hysteria clinical scales (Jensen et al., 1998). Jensen et al. also found a response style on the PIC-R (a parent-completed, empirically derived measure of global social, emotional, cognitive, and behavioral functioning) suggestive of defensiveness on the part of the parent. Psychological testing can add a dimension not always available from interview or self-report checklists, both of which may be biased by social desirability (Jensen & Rothner, 1995).

INTERVENTION

Although most adolescents have dealt with an occasional tension headache without significant life impact, treatment of chronic headaches is much more challenging. Patients with recurrent pain have typically tried (although not necessarily systematically or thoroughly) a number of pharmacological and nonpharmacological treatments and are often entrenched in maladaptive behavioral and emotional patterns. Regardless of the underlying etiology of the pain, to be successful in pain relief, intervention must move the patient (and family) away from the role of passive recipient of treatment and toward a role as an active and solution-oriented participant in their care. Cognitive-behavioral interventions can be presented as effective and efficient options for reducing headache symptoms. A variety of research supported techniques can be utilized, depending upon the individual patient's needs and the expertise of the clinician.

Research-Supported Intervention

Although few well-controlled studies unequivocally support any one treatment for chronic headache in children and adolescents, the collective data clearly support that cognitive-behavioral techniques are effective in reducing pain and for increasing daily functioning (Holden, Deichmann, & Levy, 1999; Lipchik & Holroyd, 1999). Most programs utilize biofeedback, relaxation, or other self-regulation techniques; behavioral contingency management; and/or other cognitive-behavioral interventions.

Most research has studied psychophysiological treatments, specifically biofeedback and relaxation training/self-hypnosis. These treatments have been found to be more effective than attention-placebo or no treatment groups in reducing symptoms (Larsson & Melin, 1988; Richter et al., 1986; Williamson, Baker, & Cubic, 1993). EMG biofeedback has been effective in decreasing pain (Bussone et al., 1998; Williamson et al., 1993) as has thermal biofeedback (Burke & Andrasik, 1989; Labbé & Williamson, 1983, 1984). Relaxation training decreases pain (Larsson & Melin, 1986; McGrath et al., 1992) and may increase general stress management skills (Engel, Rapoff, & Pressman, 1992). A recent review of the scientific literature found significant support for psychological treatment of recurrent headache in children and adolescents, particularly utilizing relaxation/self-hypnosis (Holden et al., 1999). A behavioral contingency management component, which teaches parents to systematically reinforce appropriate, nonpain behaviors while extinguishing pain behaviors, has also been effective in treating adolescents with headache (Beames, Sanders, & Bor, 1992). Although data are less clear regarding the efficacy of other cognitive-behavioral interventions, such as self-monitoring and problem-solving, such strategies are often embedded within the psychophysiological interventions, and clinical protocols often rely on multiple techniques. Limited data are available on the comparative efficacy of interventions.

Pharmacological Treatment

Pharmacological management of headache pain can be divided into (a) prophylactic treatment, (b) abortive measures, and (c) symptom control (Rothner, 1989). Although research has not demonstrated the efficacy of many of these medications in children, they are frequently used in clinical practice based upon empirical evidence and research with adults (Holden et al., 1998). Prophylactic medications, including beta blockers, calcium-channel blockers, antihistamines, and antidepressants, are typically initiated when the headaches are significantly interfering with the patient's daily functioning and the patient has not responded to symptomatic or abortive treatment. Increasingly, amitriptyline (a tricyclic antidepressant)

has been used prophylactically in patients with either migraine or chronic headache, both with and without comorbid depression. The effect on headache appears independent of any antidepressant effect (Rothner, 1989), and the dosages used are typically lower than that which would be used to achieve therapeutic antidepressant levels.

Serotonin agonists, such as subcutaneous or oral sumatriptan (Imitrex), are used for severe migraine, as is dihydroergotamine (DHE; Holden et al., 1998). Abortive medications used to decrease existing pain or to relieve related symptoms include analgesics (aspirin, acetaminophen, or ibuprofen), antiemetics (for associated nausea and vomiting), or sedatives. In general, narcotics and tranquilizing medications are avoided in children and adolescents (Rothner, 1989). There is limited research that addresses the relative efficacy of medications compared to psychological interventions, and medical and psychological treatments are often utilized together in clinical practice, particularly when pain is interfering with daily functioning.

A Three-Part Cognitive-Behavioral Headache Treatment Program

In clinical practice, a combination of empirically supported treatment techniques is recommended, including (a) self-regulation (biofeedback, self-hypnosis, or relaxation training), (b) cognitive-behavioral self-management, and (c) behavioral contingency management. This self-management approach is similar to that used in the management of other chronic disorders, such as diabetes or asthma, teaching the patient to take preventive actions, identify potential triggers, and create a menu of actions to reduce symptoms and improve functioning. Coordination with the patient's medical care practitioner is advised in order to provide the most effective patient care possible, as well as to continually educate the medical practitioner of the role of psychological treatment in treating the patient's pain.

Many adolescents with the primary complaint of chronic headache appear skeptical of psychological interventions. An initial focus on the more concrete components of treatment is generally better accepted, thus resulting in greater patient and family compliance. Thus, self-regulation training is typically taught first, with self-management and contingency management taught more gradually.

Self-Regulation Training

Although biofeedback and self-hypnosis are empirically proven interventions for headache pain, relatively few clinicians have the training and equipment necessary to use these as a primary treatment. Instead, teaching general relaxation training is recommended, including diaphragmatic breathing, progressive muscle relaxation (PMR), and/or autogenic relaxation. Starting with diaphragmatic breathing first is encouraged, as most other programs (e.g., PMR) utilize breathing as one component. An initial focus on breathing can provide the patient with an experience of mastery and success and increase patient trust in the clinician and intervention. The sample script on page 131 is geared at early to mid adolescence, although the wording can easily be adjusted for older or younger patients. Depending upon the needs of the patient and his or her response, other techniques can be introduced to further develop relaxation skills, such as PMR or imagery. EMG or thermal biofeedback or self-hypnosis can also be utilized if the clinician is appropriately trained.

After the initial instruction and practice of the breathing techniques, the patient should be given positive feedback in an age-appropriate manner, and a plan for home practice should be established. Generally, daily practice is encouraged, preferably several times per day, with the techniques first mastered in nonstressful situations. Building relaxation exercises into the patient's daily routine increases compliance, and the patient can be instructed to practice at set times or specific situations, such as upon awakening, after school, or at bedtime. The patient should initially practice for about 5 minutes per session. As the basic techniques are mastered, suggestions can be added during office rehearsal, such as reminding the patient that as he or she breathes out, the heart rate slows and muscles relax, decreasing any feelings of discomfort. Once a relaxed state is achieved in only a few breaths, practice can be shortened. Including diaphragmatic breathing in an adolescent's routine in a less intrusive way should be encouraged, making this type of relaxation more automatic. Such practice can be done in a few

minutes or less before or after each meal, each time the patient gets into a car, at the start of each new class, and so on. This type of daily stress management, involving practice, consistency, and active participation, is often contrary to what patients expect, imagining that something will be done *to them*.

Cognitive-Behavioral Self-Management

Self-management strategies are frequently used in teaching self-care to patients with chronic illnesses and/or disabilities. A similar approach can be extremely useful in teaching adolescent patients to manage their headaches more effectively and independently. Such intervention capitalizes on most adolescents' desire for greater independence and seems to decrease the likelihood of inadvertent reinforcement from the environment.

An essential aspect of self-management is regular data monitoring regarding a patient's pain symptoms and daily functioning. In order to track progress and identify possible contributing or maintaining factors, a headache diary is recommended, which can be prepared and given to the patient, or the patient can be given instructions on tracking headaches in a journal or notebook (sample diaries can be found in several of the on-line sites listed in the Resources section). In addition to tracking time, situation, and intensity, an "action taken/outcome" component to the diary allows for monitoring of patient use of specific techniques and their effectiveness. Activity avoidance, inadvertent environmental reinforcement, and patient coping can also become evident through diary review. The diary itself is often a vehicle for reinforcing patient compliance and active headache management.

Self-management begins with a detailed review of possible "triggers," such as physical or environmental factors or social or emotional stresses. In addition to the more concrete triggers of noise, bright light, specific foods, and so on, patients frequently appear to have difficulties with specific social or developmental situations and beliefs. Social intolerance (particularly of others who have different values and resulting behaviors), ambivalence regarding adolescent independence, management of school and extracurricular activities, and a tendency toward a rigid, perfectionist self-view are often present. The clinician must be cautious in suggesting a relationship between such variables and the onset or maintenance of pain, particularly early in treatment. Once possible triggers are identified, options for managing triggers *prior to the onset of headaches* can be taught. Specific cognitive-behavioral techniques, such as thought stopping, distraction, active problem solving, and positive self-talk, are used, in addition to initiation of the previously taught self-regulation techniques. The specific set of strategies recommended for each patient will depend upon his or her needs, beliefs, and past history and should be outlined individually for each patient. Later in treatment, many adolescents are more ready and willing to explore the relationship between their own thoughts and feelings and subsequent headaches. Themes of perfectionism, irrational expectations of self and others, and frustration at others for not doing things "the right way" are common. An awareness of these links can help young people to alter their behaviors, in order to decrease perceived distress and ultimately decrease pain. Typically, the older and more intellectually capable the patient, the more likely he or she is to engage in this type of discussion with a positive outcome.

Behavioral Contingency Management

In the initial interviews with the patient and parents, the goal of moving the attention away from pain behaviors toward alternative wellness behaviors should have been made clear. In order to avoid inadvertently reinforcing pain behaviors, pain complaints should be actively ignored or handled in a prearranged manner (such as reminding the patient to follow his or her management plan). Increased attention should instead be given for health-focused, nonpain behaviors, such as increased daily activities, regular school attendance, and appropriate social activities. Parents often engage in ineffective behaviors, such as frequently asking the patient about pain or anticipating pain in certain situations (e.g., in hot weather, in bright lights, etc.). They may interpret specific observations as indicators of pain (e.g., each time the teen is lying down he must have a headache, or if she "looks tired" it must be related to her pain). Parents may further inadvertently reinforce the pain-avoidance cycle by suggesting that the patient should "take it easy" when they see possible triggers or indicators of pain.

Initially, it may be difficult for parents to alter their responses, particularly given their distress regarding the child's pain and concern that the child's symptoms may be misunderstood or not taken seriously. Parents are often afraid that health professionals have "missed" a serious physical illness; thorough medical evaluation is helpful in reassuring the patient and parents that all avenues for evaluation and treatment are being addressed and that all care providers are working in concert. Parents may need to be reminded that no one is disputing the patient's pain, but, rather, perceptions of pain can be altered when attention is paid to the symptoms (e.g., consider the child who obtains a cut and cries only *after* seeing it bleed or *after* someone comments on it). Parents themselves can usually understand that distraction is often an effective tool for managing discomfort and that increasing attention toward pain will likely increase distress.

For most adolescent patients, a clear behavioral plan for pain management can be established, including identifying goal behaviors and consequences for meeting or not meeting expectations. The younger the patient, the greater the parental role in the patient's care, and the more parents can influence behavior through behavioral contingencies. The first portion of the plan clarifies expected behaviors that will allow the patient to engage in social or other activities or rewards (i.e., sports, television, or computer access). The patient must attend school daily and participate in routine family and community activities in order to earn the rewards. The second component lists the expectations and allowable behaviors when the patient does not attend school due to pain. Typically, this translates into remaining at home with no television, phone calls, or visitors. Parents may initially consider this to be "punishment" and may express concerns about limiting activities, believing that the patient is already disengaged with peers and that any social activity is "good for him or her." A behavioral contingency program for pain management can instead be viewed as a positive reinforcement program, restructuring social activities (or sports or other extracurricular activities) as privileges to be earned by meeting behavioral expectations of school attendance and household chores. Much of the energy in this part of treatment is spent helping parents fully understand the importance of consistent responding and teaching patients to manage their headaches and how to function *in spite of them*. If parents are doubtful or less than fully committed, inadvertent reinforcement of pain behaviors is likely.

The pace at which interventions are introduced will vary. Our experience has been that treatment moves along more rapidly for patients who are older, more educated, and more psychologically open and whose parents are more educated, more physically and emotionally healthy, and less defensive regarding psychological treatment. For those having greater difficulty, a longer time will need to be spent teaching and reinforcing each concept or technique. Individualization of treatment is essential, despite a general framework from which to start. Table 2 (p. 130) offers a guide regarding treatment strategies through a 4- to 8-week intervention program.

SUMMARY

Headaches, whether acute or chronic, are a frequent occurrence among adolescents and represent growing areas of clinical and research interests. Although etiology is not entirely understood, multiple environmental and psychosocial stress factors appear to contribute to the maintenance of chronic headaches in adolescents. Moreover, comorbid psychiatric disorders (e.g., depression or anxiety) may exist. Comprehensive assessment of these youth is therefore required, with sensitivity to the possibility that the patient and family may be hesitant to accept a psychological conceptualization of the pain. Treatment, in order to be effective, must move the patient (and family) away from the role of passive recipient and toward a role as an active and solution-oriented participant in the intervention. Sufficient evidence exists from treatment outcome studies to support the efficacy of behaviorally based treatment strategies.

Although recent years have demonstrated a surge in the study of chronic pain in both children and adolescents (Norton et al., 1999), including chronic headache, continued research is clearly warranted. A particular and critical area of interest remains around headache

classification and diagnosis, specific to the pediatric population. Which treatments are effective specific to headache type remains to be understood among youth. Additionally, it may be useful to compare behavioral interventions to pharmacological interventions among the pediatric population, whether used simultaneously or successively, and with respect to both short- and long-term treatment gains. This requires that research move beyond general efficacy trials to explore the efficiency and cost-effectiveness of behavioral interventions. These pursuits will be vital to the survival of nonpharmacological approaches to recurrent headache treatment in the future health care marketplace.

TABLE 2: Three-Part Cognitive-Behavioral Treatment Program

Evaluation and Beginning Treatment (1-2 Sessions*)

- Evaluation/diagnostic interview
- Self-regulation
 - Teach diaphragmatic breathing
- Cognitive management
 - Identify triggers, stresses, and target behaviors
 - Set up headache diary and monitoring
- Contingency management
 - Outline expectations for behavior during headache

Stage Two (1-2 Sessions*)

- Self-regulation
 - Review diaphragmatic breathing
 - Add imagery or PMR
- Cognitive management
 - Review diary, triggers, and outcome of breathing
 - Plan alternate behaviors (incompatible with headache)
 - Reinforce appropriate coping behaviors
- Contingency management
 - Review behavior during headaches
 - Contract for limitations on behavior if headaches occur

Stage Three (1-3 Sessions*)

- Self-regulation
 - Outline preferred self-regulation technique and practice
- Cognitive management
 - Review diary, triggers, and outcome
 - Teach self-talk and begin analysis of irrational beliefs
 - Teach alternate responses to distressing thoughts/feelings
- Contingency management
 - Review parent/patient compliance with contract
 - Modify plan to increase expectations as headaches decrease

Stage Four (1 or More Sessions*)

- Self-regulation
 - Review self-regulation technique and modify as needed
- Cognitive management
 - Review diary, triggers, and alternate responses used
 - Further exploration of relationships between thoughts and feelings and onset and/or maintenance of headaches
 - Relapse prevention
- Contingency management
 - Review progress and plan for relapse

*Note: Number of sessions required at each stage will vary by patient and clinician.

Basic Diaphragmatic Breathing: Sample Script

One of the first things we are going to work on is breathing. We both know that you know how to breathe. But the way you breathe, actually the way we all breathe day to day, is not the best type of breathing to help get rid of your headaches.

Let's start by talking about what exactly your body does when you take a deep breath in. What part of your body moves? [Response is usually chest or lungs.] Right, your lungs fill up, expanding your chest - but what about the rest of your body? What else moves when you really inhale? [Response is usually shoulders or stomach.] Exactly! That's just what most people do - they lift their shoulders and suck in their stomachs, thinking that will help get a better breath. But what they are really doing is working their muscles in areas that actually make it HARDER to get a good breath. If your energy, blood, and oxygen are going to the large muscles in your shoulders and abdomen, then they are not working on filling your lungs.

Have you ever seen how a young baby or animal breathes? If you watch them closely, you'll see that they don't seem to breathe with their chest or shoulders but, rather, with their stomach area. They don't "suck in" their abdomen, but actually expand their bellies as they breathe in, using the muscle at the bottom of their lungs, the diaphragm. Their shoulders and other large muscles stay relaxed.

That's what you are going to do. It sounds easy but for most people it takes practice. It tends to feel like you are doing something wrong at first, because it's so different from what you are used to.

Let me show you. I start by relaxing my shoulders and chest area. I breathe in through my nose, trying to fill up the bottom of my lungs first, almost as if I was pouring water into a big balloon, filling up the bottom first. As my lungs fill from the bottom up, my stomach area expands, and my lungs gradually fill up to the top of my chest. Then I let the air out through my mouth with a soft "whooooo" sound. Let's try it.

Start by sitting comfortably, legs not crossed and arms on the arms of the chair. Relax your shoulders and neck. Take a deep breath in through your nose, filling up from the bottom of your lungs. Good . . . fill them all the way up keeping your shoulders relaxed. Good! Now slowly let the air out, like collapsing a balloon. Good! Let's try another. [Repeat.]

How do you feel? Some people feel a bit dizzy at first, with such a rush of oxygen to their system. That will go away in a few seconds. Can you feel the relaxed feeling in your shoulders and chest? Good. [Practice a few times with much positive reinforcement for approximations of success, shaping with each attempt.]

NOTE: The younger the patient, the more adaptation needed, with simplified language and more practice to shape the response to approximately accurate diaphragmatic breathing.

CONTRIBUTORS

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Resources for Patients and Families

- American Council for Headache Education (ACHE). Nonprofit physician-patient program focusing on headache prevention and treatment with resources for both patient and health professional. (Telephone: 609-423-0258; <http://www.achenet.org/>)
- Bensen, H., & Klipper, M. K. (1990). *The Relaxation Response*. New York: Avon Publishers.
- Davis, M., Eshelman, E. R., & McKay, M. (1998). *Relaxation & Stress Reduction Workbook*. Oakland, CA: New Harbinger.
- Excedrin Headache Resource Center. A website run by the pharmaceutical manufacturer that includes patient learning modules, a sample headache diary, and information on diagnosis and treatment. (<http://www.excedrin.com/>)

Assessment and Treatment of Chronic Headaches in Adolescents

Journal of the American Medical Association (JAMA) Migraine/Information Center. Resource produced by the JAMA that includes resources for both patients and professionals. (<http://www.ama-assn.org/special/migraine/migraine/htm>)
National Headache Foundation (NHF). Resource for patients and professionals regarding types of headaches, diagnosis, and management of all types of headaches. (Telephone: 800-NHF-5552; <http://www.headaches.org/>)
Pain.Com. An on-line resource for patients and professionals that includes an on-line journal and general pain information. (<http://www.pain.com/>)