THE EFFECT OF THERAPIST AND SPOUSE ASSISTED EMOTIVE IMAGERY ON POST-SURGICAL PAIN AND ADJUSTMENT

by

Judith Burnside Peoples

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APPROVED:

George A. Clum, Chairperson

Jerard F. Kehoe

Richard A. Winett

Christopher M. Peterson

William G. Herbert

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Statement of Purpose

It is now generally accepted that the psychological well-being of a surgical patient is important to the smoothness of his/her recovery. Effective psychological preparation which reduces patient's pre- and post-surgical anxiety should in turn reduce their perception of pain and generally reduce the stress associated with hospitalization. Within the context of total patient care, there is also concern for the family, especially the spouse, as a variable which has an effect on the patient's psychological state. A spouse's expression of feelings, positive and negative as well as his/her behaviors as he/she interacts with the patient and hospital staff are salient influences on the patient.

In pre-surgical preparation, the need for efficient intervention cannot be disregarded due to the typically brief period available between hospitalization and surgery. Additionally, the techniques proposed to improve the care of patients must be both appropriate and feasible given the normal operation in a hospital where there may be a scarcity of human resources (Wolfer and Visintainer, 1975). This reality underscores the need to involve the patient and his/her spouse as active, constructive participants in the health care system.

The first premise to be tested in this study is the efficacy of teaching surgical patients a cognitive coping strategy, emotive imagery, the purpose of which is to distance the patient from the stressful situation for brief periods of time. It is hypothesized that regular utilization of pleasant emotive imagery should decrease the patients' state of anxiety, attenuate the pain experience and thus reduce the

level of hospital related stress (Horan & Dellinger, 1974; Chaves & Barber, 1974; Spanos, Chaves & Horton, 1975; Horan, Laying & Pursell, 1976; Stone, Demchick-Stone & Horan, 1977; Worthington, 1978; Turk & Genest, 1979; Lazarus, 1979; Beers & Karoly, 1979; Pickett & Clum, in press).

A second major premise to be examined is that actively involving the patient's spouse in the education, practice and utilization phases of emotive imagery to the extent that the spouse can serve as a "coach," will enhance the effects of the coping strategy (Dick-Read, 1959; Lott & Lott, 1961; Turk & Genest, 1979; Cormier & Cormier, 1979). A by-product of this type of intervention is that the feelings of frustration and helplessness frequently noted in the spouses of patients may be attenuated. Further, a more relaxed spouse should foster positive feelings in the patient during their contacts (Bilodeau, 1973; Dew, Bushong & Crumrines, 1977; Chatham, 1978; Romero, 1978; Doerr & Jones, 1979; Dziurbeiko & Larkin, 1978).

Based on a comprehensive conceptualization of the pain experience, researchers have applied psychologically-based interventions to the treatment of pain in the laboratory and in clinical situations.

The following review of the literature will discuss pain, some psychological correlates and present a representative overview of the developments in the use of cognitive interventions in pain reduction. Both experimental analog studies and clinical applications will be examined. This review will also include examples of the presence of

a partner, usually the spouse, as a therapist or "coach" in the utilization of an intervention strategy to reduce clinical anxiety and/or pain.

Treatment strategies which have been evaluated include cognitive strategies such as hypnosis, instruction and suggestion, distraction, reinterpretation of the stimulus, emotive imagery, and multi-component interventions.

Review of Literature

Psychological Factors in Pain

Consideration of the level of anxiety and stress associated with the experience of surgery has received considerable attention since Janis' (1958) seminal research in this area. According to Janis (1958), the relationship between pre-surgical anxiety and post-surgical adjustment is curvilinear. However, subsequent research has consistently supported a linear relationship between anxiety and post-surgical adjustment (Burnside, 1977; Williams, Jones, Workhoven & Williams, 1975; Auerbach, 1973; Leventhal, 1963 in Johnson, Leventhal & Dabbs, 1971; Wolfer & Davis, 1970)). More specifically evidence has emerged that the relationship between anxiety and post-surgical pain is linear (Scott & Clum, 1978). The relationship between anxiety and pain receives support from a large and varied body of literature; thus, anxiety is the most consistently identified psychological mediator of the pain experience (Kendall & Hallon, 1979; Scott, Clum & Peoples, UPM 1981, Martinez-Urrutia, 1975; Chapman & Feather, 1973; Drew, Moriarty & Shapiro, 1968; Steinback, 1968; Beecher, 1959 & 1966; Dick-Reed, 1959).

These findings which show anxiety to be related to pain are consistent with the current conceptualization of pain as a complex phenomenon which cannot be defined merely as a sensation in and of itself. Murry (1975) was among the first to use the term pain experience rather than pain because "pain experience" allowed the inclusion of all of the effects of the noxious stimuli present in the situation. This term focused attention on the various components of

subjective pain noted by observers of individuals reporting pain: physical sensations, cognitive aspects and affective components.

Hamburg, Artz, Reiss, Amspacher and Chambers (1953a) in their contact with burn patients observed that although physical aspects of the injuries were comparable, the pain experience varied among the patients. Hamburg also reported that, in general, the physical aspects of pain were less severe and the psychological components of the experience more serious than they had previously believed. Frequently, these burned patients were unable to distinguish between the pain and psychological responses and reported all negative feelings as pain (Hamburg, Hamburg & de Goza, 1953b).

Beecher (1959) demonstrated that the subjective experience of pain could be influenced more by the setting than by the amount of actual tissue damage of 215 men wounded in battle, only 25% of them requested medication for pain relief while more than 80% of a civilian surgical group with comparable tissue damage requested analgesics. Beecher attributed this difference in reaction to the significance given the wound by the patient.

Spear (1967) noted that where subjects in his research were psychiatric patients, pain as a symptom appeared with the highest incidence in patients with anxiety states. Pain was also associated with overt anxiety, a history of surgery and other somatic symptoms.

Drew, Moriarty and Shapiro (1968) found that the use of analgesics was considerably higher among patients undergoing relatively painless photocoagulation for retinal repair than in patients who had major abdominal surgery. The difference, Drew et al. (1968)

contend is that photocoagulation is associated with high levels of anxiety. Additionally, the experience of pain has been related to contingencies of reinforcement, arousal level, attention, personality variables, past experience and cultural background (Frederiksen, Lynd & Ross, 1978 in Wernick, 1980).

Thus, pain is not simply the product of a stimulus that is sufficiently aversive to activate pain receptors which then transmit a message to the brain. That pain message is modified such that the actual pain experienced and reported by the individual is not necessarily proportional to the objective stimulus.

While previous definitions of pain have stated that it is "a reaction to actual or impending tissue damage on the basis of the stimuli that arouse it . . ." (Weisenberg, 1977), a more recent theory of pain gives greater emphasis to the psychological component. Melzack and Wall (1965, 1970) propose a gate-control theory of pain in which there are three interactive dimensions of pain: a sensory-discriminative dimension; a motivational-affective dimension; and a cognitive-evaluative dimension.

> The gate-control theory of pain contains elements of both the specificity and pattern theories. It attempts to account for psychological influences on pain perception, as well as such clinical findings as spread of pain and persistence of pain after tissue healing. Conceptually, gate-control theory proposes a dorsal spinal gating mechanism in the substantia gelantinosa that modulates sensory input by the balance of activity of small-diameter (A-delta and C) and large-diameter (A-beta) fibers. Activity of large fibers closes the gate and prevents synaptic transmissions to centrally projecting T

> (transmission) cells, whereas small-diameter fibers open the gate and facilitate T-cell activity once a critical level is reached. Small-fiber activity is believed to be responsible for prolongation of pain and its spread to other parts of the body. A central control trigger can also influence the gate. Thus, cognitive processes can either open or close the gate. (Weisenberg, 1977, p. 1011).

Thus, in the gate control theory pain is not the function of any one system, rather, each specialized portion of the total nervous system makes a contribution to the total pain experience. The diversity of results encountered when traditonal measures such as analgesics, surgery and anesthetic blocks are employed may be explained by the failure to take into account the multidimensional aspect of pain. Melzack and Casey (1968, p. 435) suggest that, "the surgical and pharmacological attacks on pain might well profit by redirecting thinking toward the neglected and almost forgotten contribution of motivational and cognitive processes. Pain can be treated not only by trying to cut down sensory input by anesthetic blocks, surgical intervention and the like, but also by influencing the motivational and cognitive factors as well."

Although the gate control theory of pain has been controversial, it has spawned considerable research. Moreover, the diversity of results encountered when traditional measures (analgesics, surgery, anesthetic blocks) are employed may be explained by taking into account the multidimensional aspect of pain.

Because of the recent focus on the psychological aspects of pain and the negative or equivocal results in treating pain with analgesics

and surgery, researchers have sought more adaptive ways to manage pain and the sress associated with it.

Experimental-Analog Studies

The following studies are representative of laboratory experimentation in the area of pain, and pain reduction strategies. While it is not possible to generalize directly to the clinical situation, these studies have provided important hypotheses for clinical evaluation.

Hall and Stride (1954) as well as Kanfer and Goldfoot (1966) report that suggestion by means of negative sets increases pain perception in laboratory-produced pain. Negative set indicates the use of the word "pain" in the instructions and information about the expected intensity, location, and nature of the pain that would occur. Blitz and Dinnerstein (1968) also showed that pain threshold to electric shock, tolerance of pain, and the drug request point, i.e., the point at which analgesics (if available) would have been requested, can be affected by instructions. They asked subjects to be careful that their assessments were "clearly painful and not just strong discomfort" and noted an increase in tolerance. Blitz and Dinnerstein (1971) in a laboratory study found that pain threshold in response to cold pressor stimulation was raised when the subjects were asked to focus their attention on the cold but to ignore the pain or to imagine and thus reinterpret the cold as a pleasant sensation. Blitz and Dinnerstein interpret the relationship between pain and instructional sets as a redirection of attention rather than merely a result of relabeling the sensation and state that these findings, "lend further

support to the conceptualizations stressing the role of attentional and cognitive processes in pain perception" (p. 44).

Kanfer and Goldfoot (1966) provided a basis for use of distraction as a pain-reducing intervention with their study which demonstrated that distraction can be effective in increasing tolerance in the cold pressor test. Female undergraduates were instructed either to expect severe pain, to verbalize their momentary experiences, to utilize a clock in the room in setting a tolerance goal, or to view and describe slides in order to increase their tolerance to pain. The results indicated that the group which viewed the slides exhibited the greatest tolerance to pain. Based on the order of the effectiveness of the interventions, the experimenters further noted that the self control interventions which provided external stimuli, e.g., slides or a clock had a greater effect on tolerance than verbal techniques alone.

Barber and Cooper (1972) reported a study prompted by research of Kanfer and Goldfoot (1966). These researchers attempted to discover effective distractors that can be utilized by individuals in the clinical/natural setting where the use of special equipment may not be practical or possible. Female nursing students tested the effectiveness of three distractors as pain reducers in the laboratory: 1) listening to a tape recorded story; 2) adding aloud; and 3) counting aloud. While listening to the story and adding aloud were effective for the first minute, neither was effective by the end of two minutes. The post-experimental interview revealed several reasons way the distractors were less effective than expected. The subjects reported that during the pre-treatment pain test and under the

control treatments, they used their own spontaneous techniques such as self-timing by observing their watch, concentrating on objects in the room and thinking pleasant thoughts. Some subjects also stated that they would have preferred to use their own strategies rather than the one the experimenter instructed them to use.

Chaves and Barber (1974), in a subsequent study, compared the effectiveness of two cognitive strategies in reducing pain induced by a weight placed on the subject's finger: imagining that their finger was insensitive and imagining pleasant experiences (goal directed fantasies) with and without experimenter modeling of the strategy. While the experimenter modeling procedure was largely ineffective, the results indicated that both cognitive strategies reduced the subjects ratings of pain. The subjects who used pleasant imagery as distractor showed a greater reduction in pain than those who imagined insensitivity, but the difference was not significant. Again, in this study, the subjects stated that while they used the prescribed cognitive strategy, they would have preferred to use their own coping strategy.

Grimm and Kanfer (1976) lend additional support to the idea that individuals may effectively utilize their individualized strategies in pain reduction. The experimenters cite research in attribution theory which suggest that behavior change is more durable when the person attributes the change to his own efforts. The purpose of Grimm and Kanfer's experiment was to evaluate the effectiveness of the subject's covert/symbolic responses, brief relaxation training, and the subject's expectations of reduced discomfort on tolerance, heart rate and self reports of discomfort when they experenced the cold pressor task.

The relaxation intervention consisted of a modified version of progressive relaxation; the expectancy/suggestion group was to expect less pain due to physical adaptation. The subjects in the verbal symbolic group were trained in responses consisting of thoughts about a trip with a friend and having a party. Although the experimenter suggested the topic, the content was supplied by the subject with the experimenter eliciting the details. The results indicated that training individuals to use self generated verbal/symbolic controlling responses enhanced tolerance significantly more than relaxation training, an induced expectancy of less discomfort or providing no training at all. The authors' explanation for this result was that "such activity was incompatible with attending to the aversive stimulation of the task" (p. 599). The subject's responses on the Postexperimental Questionnaire emphasized the crucial role of the content of the "cognitive distraction." That is, "The controlling response must serve to compete with the aversive qualities of the situation in order to be effective in enhancing tolerance" (p. 599).

Both hypnotically suggested analgesia and pleasant imagery may be considered interventions whose content competes with or is incompatible with the aversive aspects of a pain inducing situation. Greene and Reyher (1972) conducted a study with female college students designed to evaluate the effectiveness of suggested analgesia and pleasant imagery in modifying tolerance of an increasingly intense electrical stimulus. For the hypnosis subjects, both the analgesia and the analgesia plus pleasant imagery conditions were effective in modifying tolerance with the analgesia alone condition producing the

greatest tolerance. The pleasant imagery alone condition did not produce a significant group tolerance increase. The authors' explanations of this finding focused primarily on the type of imagery created by the subject. A post hoc analysis of imagery content suggested that imagery which was not focused on the body did modify tolerance levels, while images focused on the body did not.

Spanos, Horton and Chaves (1975) note that suggestions of analgesia have been reported as effective in reducing experimentally induced pain (Blitz & Dinnerstein, 1971; Chaves & Barber, 1974), with or without a hypnotic induction procedure (Evans & Paul, 1970). The analgesia suggestions typically request subjects to imagine situations that are inconsistent with the pain experience, i.e., that the stimulated body part is numb and insensitive. Spanos, Horton and Chaves (1975) tested whether any pattern of fantasy that absorbs the subject's attention will attenuate the pain experience or whether the fantasy that is inconsistent with the pain situation is the more effective. The experimenters also tested the hypothesis that the subjects who are highly involved in their imaginings will experience less pain (Chaves & Barber, 1974). The results indicated that both a relevant and irrelevant strategy were successful in elevating pain threshold above that of the control groups for subjects who showed high pretest thresholds, but the relevant strategy (inconsistent with the experience of pain) was the more potent. Under both experimental conditions, the subjects who became highly involved in their fantasies (as measured by a Likert-type self rating scale) were more successful in controlling their threshold responses to the cold pressor test. The

use of cognitive strategies was not effective for those subjects with low pain thresholds. This finding is not consistent with the results obtained by Jaremko (1978) who tested the efficacy of cognitive strategies in the control of laboratory-induced pain. He found that rehearsal and rationalization strategies were more effective than irrevelant thinking and no strategy in increasing the amount of time subjects could keep their hand immersed in ice water over their own baseline. Moreover, while others (Spanos, et al., 1975) have reported that the effect of cognitive strategies is limited to high threshold subjects, this was not the result in this study. Jaremko (1978) reported that "low threshold subjects showed significant change whereas high threshold subjects showed no effect. This latter result is apparently due to a ceiling effect on the measurement scale. Therefore, it may be that the effect (of cognitive intervention) occurs with all subjects regardless of pretest pain threshold (p. 224)." Jaremko (1978) also notes tht the extent to which a person becomes involved in imagining the strategy has an effect on changing pain tolerance. Subjects who were highly involved and complied with the experimenter's instructions showed a pronounced positive effect while those who were involved to a minimum degree actually showed a negative effect.

Recently, a study by Clum, Luscomb and Scott (in press) examined the efficacy of a cognitive strategy versus relaxation training in coping with pain induced by a blood pressure cuff. The subjects were randomly assigned to one of four groups: 1) relaxation training; 2) relaxation instruction; 3) cognitive strategy (attention-

redirection) and; 4) no treatment control. Relaxation training was found to be effective in reducing distress during the stimulus presentation. Verbally reported pain, assessed after the pain induction, was also reduced by relaxation. Attention-redirection reduced the amount of "felt pain" during the procedure as indicated by cross modality matching assessed via squeezing a hand dynamometer "to equal the level of felt pain."

Stone, Demchik-Stone and Horan (1977) tested the effectiveness of two components of the Lamaze method of child birth and In Vivo Imagery. The Lamaze techniques were a breathing technique and distraction via focal point visualization which involves concentrating on a particular object to the exclusion of al else in the visual field while relaxing voluntary muscles to the greatest extent possible" (p. 451). In vivo emotive imagery involved the use of "images which generate positive emotion to block anxiety and/or anxiety-confounded pain in inescapable situations" (p. 451). Subjects in the emotive imagery condition were given approximately 15 minutes of imagery training and then presented a tape recorded vignette developed by the experimenter. The results indicated that the imagery technique was slightly more effective than both Lamaze techniques in enhancing subjects' tolerance to ice water induced pain.

Worthington (1978) reported a study in which he examined the effects of imagery content (neutral or pleasant), choice of content (subject-generated or yoked with no choice) and explicitedly planned coping self verbalizaton versus an explanation of the self verbalization concept on tolerance to the cold pressor task. The author reported the following conclusions:

1. "Subjects who had a choice of imagery content had longer pain tolerance and less self-reported pain than subjects who did not chose the content of their images."

2. "Involvement in imagery, as measured by self-reported vividness of imagery mediated increased pain tolerance but not self-reported pain" (p. 238).

3. Pleasant imagery was not superior to neutral imagery but subjects who planned self verbalization had longer pain tolerance than subjects who did not do any active planning.

It should be noted that these results are not as clear cut as one might wish because only two of the eight treatment conditions were superior to the attention-placebo control group at increasing subject's tolerance of ice water. Those groups were combinations of neutral imagery-self verbalization-choice and pleasant imagery-self verbalization-choice conditions. This lack of difference in attributed in part to a celing effect in the design. Despite this, the implications for designing future interventions are clear.

Generally, high involvement in imagery has resulted in reduced sensitivity to pain (Chaves & Barber, 1974; Kanfer, 1966; Jaremko, 1978) but the crucial question to be answered is how is involvement to be fostered? The results of Worthington's (1978) study indicated that the difference in the effect of neutral versus pleasant imagery was not significant, but that choice of content and self verbalization significantly increased tolerance. Self report of pain was influenced by choice of imagery content. Choice of content may thus be the more potent variable to consider in enhancing treatment effects.

There is further evidence for the importance of "choice" in reducing pain responding. For example, Kanfer and Grimm (1976) encouraged subjects to use their own self-generated statements and Scott and Barber (1977) allowed subjects to choose from a set of suggested cognitive strategies, but did not test the effect of choice directly. Worthington (1978) tested empirically the assumption that allowing subjects to choose among pain-control strategies would increase their tolerance. The author cited several possible reasons for the success of personally generated imagery including the enhancement of self efficacy as a mediator for increasing an individual's pain management. Subjects who had a choice of imagery content used the images they developed more than subjects in the no choice condition and they were more vivid.

Given that choice in coping strategy content has evolved as an important variable in designing intervention strategies, it is instructive to examine some examples of research done with multi-component interventions as they generally offer choice of coping strategy as part of the "package."

Scott and Barber (1977) offer an important observation based on their study which tested the use of multiple cognitive strategies (five) under brief (45 sec) and longer instructions vs. the use of one specific cognitive strategy (to concentrate on pleasant events). Their results indicated that both the brief and longer instruction to use five cognitive strategies raised the average pain tolerance approximately 100% above the control level. The single pleasant imagery strategy had no significant effect. However, the combined strategies

did not significantly reduce the subject's rating of the pain intensity or their self report of distress. Thus, the authors' note, it "appears that it is much easier to change tolerance of pain than to change perception of pain or the distress produced by pain." This result was also found in the Kanfer and Goldfoot (1966) study where tolerance was increased by the intervention but the ratings of pain were not altered significantly. Cognitive strategies have reduced subjects ratings of pain but generally where pain tolerance was not a variable since the subjects were exposed to the pain stimulation for a constant, brief period (Chaves & Barber, 1974).

A major finding of Scott and Barber's (1977) study should be underscored. Both the long and brief cognitive strategies were effective in raising pain tolerance. This has important implications for clinical use where time factors may play an important role. Also, it should be noted that the multiple strategies afforded the most choice for the subject in a situation where formal training in the strategies was absent.

Avia and Kanfer (1980) conducted a study designed to compare the effectiveness of training subjects to engage in experimenter-prescribed pleasant imagery during exposure to the cold pressor task vs. a group receiving the same training but with a choice of imagery content or the use of any other self generated cognitive coping strategy (self management group). Avia and Kanfer (1980) demonstrated that cognitive control of the pain experience can be significantly enhanced when the training format assures that the subject is informed about a variety of cognitive strategies, encourages

personal choice, stresses personal competence. Unanswered is the question of which component, singley or in combination produced the effect.

Clinical Studies

Experimental-analog studies provide a basis for testing pain and anxiety reduction strateges in clinical situations. Typically, aversive medical procedures and surgery have been the crisis situations that have provided examples of acute pain similar to laboratory studies of tolerance. However, it must be noted that rigid experimental control is not possible in clinical settings nor do patients facing real impending stress respond like experimental subjects. However, if pain and anxiety reducing strategies are to be relevant to and included as (clinical hospital) procedure, their usefulness must be demonstrated in clinical experiments. Except where analog studies are needed for clarification, this section will review efforts to apply cognitive interventions clinically.

Langer, Janis, and Wolfer (1975) demonstrated that cognitive interventions can be effective in reducing post-operative stress. Their study examined the effectiveness of a coping device which involved the positive reappraisal of surgery, calming self-talk and cognitive control by means of selective attention. The cognitive intervention groups were compared with groups that received information and reassurance. The results indicated that the cognitive coping device was significantly effective in reducing pre-surgical stress as assessed by nurse's evaluations of patient levels of anxiety and ability to cope with stress before and after the intervention.

The cognitive intervention was also the most effective in reducing the number of analgesics administered post-surgically.

We will now examine, first multiple and then single cognitive strategies as they have been utilized in various medical settings.

An example of a multiple strategy intervention is Stress inoculation. Basically, Stress Inoculation is an approach which has been found effective in the management of anger (Novaco, 1976, 1977); interpersonal anxiety (Meichenbaum & Turk, 1976); and experimentally induced pain (Horan, Hacket, Buchanan, Stone & Demchick-Stone, 1977). As described by Meichenbaum and Turk (1976), Stress Inoculation is composed of three phases: 1) education which provides the patient with a conceptual framework for understanding his reaction to stress; 2) rehearsal of multiple coping methods including behavioral and cognitive strategies; and 3) application which consists of use of the chosen coping strategy with imagined, analog or real stressors. Wernick (1980) reports positive results from a study designed to test the effectiveness of Stress Inoculation in the management of the clinical pain experience of eight severely burned patients relative to a no treatment control group. The treatment phase consisted of 30-40 minute sessions for five consecutive days. The nursing staff of the burn unit was trained by the investigator to conduct the five therapy sessions and to collect the dependent measures. The pain experience was measured in relation to state and trait anxiety (Spielberger, Gorsuch & Lushene, 1970), requests for and actual numbers of analgesics obtained, observations and behavioral subjective ratings by the burn unit staff and patient self report.

Despite the strong possibility that serious confounds were present in this study due to the use of nurse-therapists as raters and the small number of subjects, the study provides support for the use of Stress Inoculation as an intervention to help burn patients manage their pain. Of particular relevance to the present study is the information obtained during interviews designed to give feedback to the investigator at the conclusion of that study. Most of the subjects reported that cogntive strategies were the most helpful in getting through the painful procedure.

Kendall, Williams, Pechacek, Graham, Shisslak, and Herzoff (1979) conducted a study whose purpose was to evaluate the effectiveness of a cognitive behavioral intervention and a patient education intervention, both components of the Stress Inoculation Package, in reducing self reported state anxiety before and during cardiac catheterization. Adjustment during the procedure was measured by the ratings of physician and technician who were blind to the experimental manipulation received by the patient. The results revealed that both the cognitive and information groups were significantly more adjusted than the control group and that the cognitive behavioral treatment was the superior intervention.

The cognitive intervention employed by Kendall et al. (1979) involved educaton and behavioral rehearsal in the process of discriminating anxiety-related dues, applying the patient's own previously identified preferred cognitive way to cope with stress, self reassurance and self reward for labeling the entire experience as efficacious coping. An important emphasis in this study was the

encouragement and reinforcement of the patient's own cognitive strategies rather than the imposition of the experimenters' intervention.

Horan, Hackett, Buchanan, Stone and Demchick-Stone (1977) provides laboratory support for the findings reported by Kendall et al. (1979) in an analysis of Stress Inoculation. Seventy subjects were assigned to one of five treatment conditions designed to help them deal with ice water and pressure algometer induced pain. The treatments were: 1) a no treatment control; 2) nonspecific treatment which consisted of education about the psychological dimension of pain; 3) coping skills training which included deep muscle relaxation training, and in vivo emotive imagery; 4) repeated exposure to the painful stimulus; 5) Stress Inoculation which included the coping skills and exposure components. The results indicated that coping skills training was the successful treatment as measured by tolerance, threshold and self-reported discomfort. Neither education or exposure had any effect. Thus, conclude the authors, "Essentially then, on direct measures coping skills proved to be the only reactive component in the Stress Inoculation paradign" (p. 217). It is unclear, however, which of the components of the coping skills phase was the most effective.

Jaremko (1979) concludes a review of the Stress Inoculation Literature by stating that "current research on SI is marked by great procedural variation" (p. 35), such that it is not possible to sort out definately which phase of the package is the most important. Typically, each phase has multiple components, so that even if there is agreement

that a particular phase is critical, there is no agreement about which component was used by subjects/patients and which worked. In the programs for pain, for example, "the client is given a number of (cognitive) techniques and encouraged to use them 'cafeteria-style,' i.e., as they are needed and most likely to be effective" (p. 41). This lack of preciseness is clear in the procedures of the multiple studies previously discussed. Thus, Jaremko underscores the need for research that employs uniform procedures, component analysis, and a focus on discovery "which of the skills are most effective within any given population" Jaremko (1979).

Despite the lack of precision in the clinical studies reviewed, there are analogue studies which examine the components of the coping phase of Stress Inoculation. Hackett and Horan (1980) attempted to "isolate the active ingredients of the coping-skills component" (p. 107) in controlling pain induced by the cold pressor task. The treatments examined were: 1) relaxation training with an emphasis on slow, deep breathing; 2) cognitive strategies which included mental arithmetic, somatization ("focusing on bodily sensation in a detached manner" [p. 110]), imaginative transformation of the pain or its context, and in vivo emotive imagery; 3) and instruction about the four stages of dealing with stress. The results indicated that the relaxation training was the most effective in increasing tolerance, but had no effect on threshold or on self-reported discomfort. The subjects who received training in cognitive coping skills exhibited the highest threshold, but no main effects were found for tolerance or discomfort. However, on the questionnaire given at

the conclusion of the experiment, there was "a pronounced tendency for subjects to claim use of (cognitive) skills regardless of the treatment condition to which they were assigned" (p. 113). Additionally, the cognitive component in this experiment included a variety of mental exercises; thus it cannot be determined which was the most useful. Moreover, if it is indeed true that focusing on the body is not beneficial for pain reduction, the inclusion of the somatization may have diluted the effect of the cognitive strategies.

Worthington and Shumate (1981) investigated more precisely than Hackett and Horan (1980) elements of stress inoculation training for pain control. Using the cold-pressor task to elicit pain, treatment strategies involved: "the presence or absence of (a) pleasant imagery (b) a conceptualization of pain as a multistage process and (c) planned, explicit self instructions" (p. I). The women trained in pleasant imagery exhibited greater tolerance than women who did not use imagery. There was, however, no difference in self-reported pain at withdrawal from the ice water. Subjects who did not use imagery but heard pain explained as a multi-stage process exhibited more tolerance and less self reported pain at withdrawal from the ice water than those who heard no explanation, however, there was no additional benefit from hearing the multi-stage conceptualization to women who used pleasant imagery.

Worthington and Shumate (1981) interpret their findings in terms of Melzack's Gate Control theory (1975, Melzack & Chapman, 1973). Pleasant imagery may affect the cognitive-evaluative component of pain (by means of introducing an element of personal control) as well as

affecting the motivational-affective component as suggested by Meichenbaum and Turk (1976). Women who were not trained in the use of imagery benefitted from hearing the conceptualization of pain as a multistate process over which they could gain some control, but hearing that information added little to the effect of using pleasant imagery. Thus, Worthington and Shumate (1981) conclude, "pleasant imagery effectively relieves pain and may account for much of the effectiveness of stress inoculation training" (p. 1).

Single cognitive strategies have also been utilized with mixed results in the clinical setting. The following is a representative review of the literature dealing with single cognitive strategies. The extent to which the strategy involved allows patient choice or personalization of the intervention varies depending on the investigator's design.

Field (1974) examined the effects of having surgical patients listen to recorded suggestions of relaxation, (comfort, freedom from pain, smooth recovery as well as simple information about their operation on the day before surgery. A control group heard a recording describing the hospital facilities. No significant differences between the two groups were found on ratings of nervousness or in speed of recovery. However, there were numerous medical procedures included in this study ranging from amputation and laminectomies to excisions which were conducted under general, local or spinal anesthesia. The differences in the anxiety aroused by this wide variety of procedures may have obscurred possible results that could have been obtained from this intervention. Studies which limit their

patient population to a single procedure or type of surgery provide a better test of the effects of psychological interventions.

Pickett and Clum (in press) examined relative effectiveness of muscle relaxation training, relaxation instruction, non-personalized attention-redirection and an attention placebo control in the reduction of post-surgical pain and anxiety for cholecystectomy patients. Post-surgical state anxiety was measured by the Present Affect Reaction Questionnaire (Endler, 1976); post-surgical pain was assessed by the McGill Pain Questionnaire and the number of post-surgical analgesics. While the data clearly supported the efficacy of attention-redirection in reducing state anxiety, its effect on post-surgical pain was equivocal. The only significant effect for pain was obtained when comparing attention-redirection to the control group on the PPI worst pain measure (a subscale of the McGill Pain Questionnaire). The authors hypothesized that the single treatment session given the day before surgery and the brief practice time available was sufficient to decrease self-reported anxiety but was insufficient to affect the pain response.

Jarvis (1978) reported a study whose purpose was to examine the effect of in vivo emotive imagery in reducing the anxiety of male patients undergoing upper gastrointestinal endoscopy. Following routine procedural preparations, the subjects received a brief imagery training session and selected one of three prepared tapes to listen to (via headphones) during the medical procedure. When the imagery group was compared with a group listening to recorded music and a no treatment control group, no significant differences were found in

the dependent measures which included physiological measures, nurses' and doctors' behavioral ratings and the Spielberger State Anxiety Inventory. Moreover, no significant interaction were found between treatment and coping disposition as measured by the Modified Repression-Sensitization Scale. It should be noted that there was no choice or personalization of imagery present in this design. However, Grant (1978) reported that, when combined with Autogenic Training, positive mental imagery was effective in decreasing resistance during root canal therapy; and, along with the Autogenic Training alone group, recovered more quickly than an infomration only group. The treatment groups also reported less discomfort than the information only group.

Horan, Laying and Pursell (1976) expanded on the analog research indicating that emotive imagery was more effective than distriction or no treatment in increasing pain tolerance to laboratory induced pain (Horan & Dellinger 1974). Horan et al. (1976) examined the use of in vivo emotive imagery in the reduction of (mild) dental discomfort (routine tooth prophylaxis). After 3 minutes of taped imagery training, three taped conditions were compared in this study: 1) relaxation producing images such as walking through a lush meadow; 2) neutral images consisting of two digit numbers which the subject was instructed to imagine displayed on white poster board; and 3) a blank tape. Listening to the relaxing imagery for five minutes produced greater comfort levels as measured by self report than did the other two interventions.

It is apparent that the results obtained when employing a cognitive strategy to mediate pain and anxiety are mixed. However, as Turk and Genest (1979) note, when considering the plethora of studies which include cognitive intervention and those with cognitive components such as stress inoculation that "taken together these studies provide a strong albeit somewhat presumptive case for the relative efficacy of multi-faceted cognitive-behavioral therapeutic regimens. The necessary packages have not been established, but as Mahoney (1974) suggests, first we need to demonstrate a significant effect, then we can proceed to component analyses. It appears to us that the time has come for the conduct of such component analyses, as well as for comparisons of the various treatments with a diversity of patient populations" (p. 311). Karasu (1979) notes that there is a need for comparison studies to establish which interventions are most helpful for patients within a single diagnostic category.

Moreover, since cognitive and behavioral interventions appear to be quite complicated, "simply providing a group of patients with procedural-sensory information, a suggestion to employ cognitive or behavioral coping strategies, or specific training in the control of physiological processes does not appear to be sufficient in all situations with all patients. Important parameters such as content of the information, the mode of presentation (e.g., audio or videotape, modeled, written, one-to-one, group presentation), characteristics of the presentor, temporal factors (i.e., the most appropriate time and frequency of presentation), the degree of threat perceived by the patient, long and short-term consequences (beneficial or harmful),

the actual and perceived effectiveness of the information, training, or skills acquired (cf Averill, O'Brien, & DeWitt, 1977), feelings of self-efficacy (Bandura, 1977) or self confidence and involvement of significant others must be given careful attention (Turk & Genest, 1979, p. 311). Additionally, it has been suggested that while "package" cognitive strategies will be utilized and are effective, it may be even more effective to allow subjects or patients to develop the content of their own strategy (Chaves & Barber, 1974; Meichenbaum, 1976; Worthington & Shumate, 1981).

Family Involvement Studies

However, even if the training in adaptive coping is done by the most efficacious modes and methods, it may not be sufficient to produce the desired outcome. Not only must a patient have the appropriate skill available, he must be motivated and capable of utilizing those skills when the situation requires. "A failure to produce these skills when they are present is likely related to the individual's internal dialogue, what they say to themselves about the situation . . ., the adequacy of the coping repertoire, belief in the ability to master the situation, and the necessity of having to use some form of coping strategy" (Turk & Genest, 1979, p. 313). Training and encouraging patients to utilize psychological strategies is time consuming, and as Wolfer and Visintainer (1975) note, techniques proposed to improve the care of (pediatric) patients must be both appropriate and feasible given the normal operation in a hospital where there may be a scarcity of "human and material resources" (p. 244). One of the parameters cited by Turk and Genest (1979) as

important to consider when attempting a cognitive intervention is the "involvement of significant others" (p. 311). Included in the following reviews are several studies that demonstrate the potential benefit derived from utilizing a family member in the treatment process. Not only does this provide an additional skilled caretaker, but it builds on a well accepted need to consider the patient as a resource and active partner in order to tailor the therapeutic regiment to the individual (Bandura, 1977, Turk & Genest, 1979).

The childbirth literature contains studies which support the participation of a significant other (usually the husband) as a coach to help the mother utilize the skills she has presumably learned in childbirth classes (Lamaze, 1970; Dick-Reed, 1959, Cormier & Cormier, 1979).

Horan (1973), in an anecdotal report, states that having his wife concentrate on a pleasant calm scene which he verbally "painted" reduced the discomfort experienced during previous contractions.

Henneborn and Cogan (1975) investigated the differential effect of having the husband present for labor and birth compared to having the husband present during only the first stage of labor. All of the subjects and their husbands were enrolled in childbirth education classes and thus received basically equivalent training. All husbands were encouraged to be involved as the "coach" through both labor and birth. The responses of 38 couples where the husband was present throughout labor and birth were compared to the responses of 11 couples in which the husband participated only through the first stage of labor. The results indicate that the wives

whose husbands were present for labor and birth had a lower probability of receiving pain medication in all stages than those wives whose husbands were present only in the first stage of labor. When asked about their emotional response to the total birth experience, the more involved couples felt more "highly pleased and enthusiastic" than did the less involved couples. Henneborn and Cogan's study, makes stronger the case already stated for husband participation in the birth experience by Tanzer (1967 in Henneborn & Cogan, 1975) who compared groups in which the husband was or was not present for the second stage of labor and birth. She found that the husband's presence had a profound effect on the wife's reported experience of childbirth. In each case, where the wife reported a "peak" experience during birth the husband was present in the delivery room. Even if the husband elects not to participate in the actual birth experience, his attendance at child-birth classes has been reported to reduce pain during labor, as well as being positively related to the wife's perception of her husband's competence (Tanzer, 1967 in Henneborn and Cogan, 1975).

Romero (1978) used an intervention whose goals were to reduce the anxiety of the post-surgical Intensive Care Unit patients and their families. The intervention consisted of teaching a class designed to inform the patients and their families about the physical set up of the ICU and the nursing procedures they would encounter. While no data analysis was performed, anecdotal data indicated that both the patient and family levels of anxiety are reduced by means of this teaching program.

Chatham (1978) provided experimental evidence for the value of family involvement in the reduction of post-cardiotomy psychosis and family-patient anxiety. The purpose of the study was to "determine if the quality of the patient-family interaction in an ICU during the first four days following open heart surgery would influence the patient's post-operative behavior" (p. 995). More specifically, would there be a difference in the mainfestation of post-cardiotomy psychosis among patients whose significant family member (in this study, the patient's wife) did not receive the intervention? The content of the instruction consisted of the functions of the equipment in the ICU, the routine post-operative care given the patient, and the patient's need for eye contact, frequent touch, and verbal orientation to time, person, and place. The family member agreed to utilize eye contact, and touch while orienting the patient to time, person, and place for ten minutes three times a day while visiting in the Intensive Care Unit. Behavioral ratings were taken every six hours by nurse raters who had been previously trained in the use of a behavior check list and who were blind to subject groups. The findings indicate that patients whose wives provided contact with the patient as instructed exhibited fewer manifestations of post-cardiotomy psychosis. Specific results indicated that the experimental subjects were better oriented to time, person, and place, were less confused as indicated by speech and behavior, were more appropriate and had fewer delusions as well as longer sleep than those in the control group. However, there was no significant difference between control and experimental groups in other behaviors rated including agitation,

complaints, depression and anxiety. These researchers noted also that in each case, the wife was quite anxious and concerned about what more she could do to aid her husband's recovery and was frustrated because she lacked the concrete knowledge to be constructively active. The authors thus recommend that an effort be made to discover additional behaviors that family members could learn in order to participate more fully in the patient's care.

Doerr and Jones (1979) examined the effect of family preparation on state anxiety levels (Spielberger, Gorsuch & Lushene, 1970) of Cardiac Care Unit patients. Based on the premise that family members who are unprepared for the procedures and equipment of the CCU will become anxious and transmit that anxiety to the patient, the experimenter gave pre-CCU exposure information to the family members of one group of patients but not to the control group. The information consisted of a booklet which provided general information about the functioning of the CCU and an explanation of monitoring procedures. Additionally, the family was to ask questions of the CCU nurse who was available specifically for this purpose. The results indicate that the patients whose family members were educated prior to visiting the CCU showed a significant decrease in state anxiety as compared to a control group who received no special information.

Not all research has linked spouse anxiety directly to patient anxiety. Barkdall (1975) conducted a study whose purpose was to "provide descriptive information about the relationship of patients' and spouses' anxiety and the patients' post-operative pain in the surgical situation. Thirty patients who were scheduled for various

types of surgery were given the State Trait Anxiety Inventory (Spielberger, Gorsuch & Lushene, 1970). Post-operative pain was measured by the number of analgesics received for the first two post-operative days. Pain was also rated by the investigator using the Chambers-Price Modified Pain Scale from which an average score was computed from three pain assessments. Analysis of the data failed to find a relationship between the couples pre-surgical A-states, nor was there any relationship between the spouses' pre-surgical state or trait anxiety and the patient's post-surgical pain. However, patients' A-state anxiety was positively related to their post-surgical pain as expected. Definative conclusion cannot be made in this study due to the confounding variables of sex and multiple types of surgery. Also, it should be noted that Johnston (1980) reported that state anxiety remained elevated post-surgically, and for men undergoing orthopedic surgery, the anxiety was even higher in the post-operative period. Spouses' anxiety may also show similar patterns post-surgically and these anxiety levels may be the more important in relationship to post-operative pain and anxiety in their husbands.

Dziurbejko and Larkin (1978) designed a study to examine the effects of including the surgical patient's family in pre-operative teaching, which consisted of basic pre-surgical information and instructions about coughing and moving comfortably. They hypothesized that if the patient's family were included in the pre-operative instruction to the patient and were encouraged to participate in the patient's care, the positive effects would be greater than when the patient only was instructed as measured by nurses,

raters who were blind to experimental group membership. The results indicated that while the difference between the two experimental groups (patient with family and patient alone) were not significantly different, "the directions of the means points to more cooperativeness, less patient and family anxiety, fewer questions, and less post-operative demandingness on the part of patients who were taught with their families present. Moreover, "only the patient family group differed from the control patients on the important variables of number of days in the hospital and number of injectable narcotics" (p. 1894).

Lott and Lott (1961) state that a primary condition for the development of positive attitudes toward a person is receiving positive rewards in his/her company. It may well be important to structure the hospital relationship between a patient and his family in a way that would increase the probability of positive, rewarding interactions. The resulting positive attitudes toward one another should tend to increase communication which should in turn tend to increase feelings of cohesiveness. Generally, the more cohesiveness in a group, the more individual members function as secondary reinforcers for the behavior of one another. The fostering of the cohesiveness of a patient's family in the hospital may then increase the likelihood that the family will encourage the patient to comply with the treatment regimen. That encouragement of the family then has the possibility of being both a reminder to utilize skills learned as well as being a reinforcer for doing so.

Conclusions, Rationale and Hypotheses

The present study is designed to respond to the direction suggested by Mahoney (1974), viz, to examine a component of cognitive treatment packages with a specific patient population (single surgery) in order to determine the most efficacious pre-surgical psychological intervention in reducing post-surgical pain and distress.

The literature indicates that specific cognitive strategies which distance the patient from the surgical situation thus allowing him to focus his attention away from the painful stimulus and employ adoptive, temporary denial may be the treatment of choice to reduce anxiety and pain (Pickett & Clum, 1981). Based on the literature previously cited, positive emotive imagery based on patient generated content provides a viable intervention to be utilized in the hospital setting (Worthington & Shumate, 1981).

Finally, based on the existing literature (Chatham, 1978; Doerr & Jones, 1979), there are potential benefits in involving the patient's family, especially the spouse, in the patient's pre-surgical intervention and post-surgical implementation of that coping skill.

Given the literature examined to this point, the following hypotheses were advanced:

1. The patient's development, training in and use of personalized Emotive Imagery as a means to relax and distance himself from the surgical situation would result in reduced pain, anxiety and depression. Further, patients using Emotive Imagery will have a better post-surgical adjustment as measured by the Hospital Recovery Index and number of Days in Hospital when compared to the control group.

2. The positive and active involvement of the patient's spouse as a "coach" in the training and utilization of the personalized imagery technique would result in less pain, anxiety, and depression than either the control group or the therapist-assisted treatment group. Further, the spouse-assisted treatment group will have a better post-surgical adjustment as measured by the Hospital Recovery Index and number of Days in Hospital when compared to the therapist-only assisted group.

Method

Subjects

Twenty-four white male, married adults who were admitted for their first cervical or lumbar laminectomy and their wives were the participants in this study. The patients were hospitalized at the Charleston Area Medical Center, General Division in Charleston, West Virginia and were the patients of four neurosurgeons. Their ages ranged from 29 to 62 with a mean age of 42. None of the patients had a medical history of organic brain damage, mental retardation, or any other salient psychological disturbances. Their educational backgrounds ranged from 8 years to 16 years with a mean educational level of 11.6 years.

The patients were divided into two treatment groups and a no-treatment control group of eight subjects each. An attempt was made to assign patients by a stratified randomization process matching for duration of back pain (acute-less than 6 months; chronic-6 months or more); location of injury (cervical or lumbar) and surgeon (four). However, some assignment flexibility was necessary in order to have equal cell sizes, to avoid contact between subjects in different groups and to handle several new subjects on one day.

Of the patients who were contacted to participate, three refused. One was an older man whose son would not allow his involvement, the second and third said they were too nervous to participate.

There were two subjects, both in the same intervention group (therapist-assisted) who refused to continue in the study. One

subject's wife became upset by her husband's participation, the other hemorraged during surgery preventing the operation from being completed.

Groups

The 24 participants in this study were divided into three groups; a no-treatment control group, a therapist only assisted emotive imagery group and a therapist plus spouse assisted emotive imagery group.

The control group completed the battery of psychological tests and time was then spent with them in general conversation about surgery, the experience of hospitalization and other subjects they introduced. This time was intended to control for attention-placebo effects. Except for the wives' completion of the psychological measures, no effort was made to include them.

The therapist-assisted group (Emotive Imagery with therapist assistance only) completed the basic battery of psychological measures and were taught a cognitive relaxation strategy. This consisted of instruction in the development and use of a calm or pleasant scene and two sessions of guided practice of the scene by the experimenter only. Except for completion of the questionnaire, no effort was made to actively involve the spouse.

The spouse-assisted group (Emotive Imagery with spouse involvement) was given the same psychological battery as the other groups and given the same basic relaxation instruction as the therapist-assisted group. However, in this group the spouse was included as much as possible. She was actively included in the explanatory

phase, instructed in the theory of the calm scene and instructed in how to guide the second practice scene. She was given the role of the relaxation coach.

Psychological Measures

Dyadic Adjustment Scale, Dyadic Cohesion and Dyadic Consensus Subscales (Spanier, 1976). This measure consists of eighteen items taken from the Dyadic Cohesion and Dyadic Consensus Subscales of the Dyadic Adjustment Scale, which in its entirety provides an overall measure of couples adjustment. Spanier (1976) reported that each subscale of the total DCS may be used independently to measure the aspect of the couple's relationship of interest to the investigator.

In this study the areas of interest were the amount of agreement there was in the relationship (Dyadic Consensus Subscale) and the amount of shared activity the couple experienced (Dyadic Cohesion Subscale). Spainer (1976) notes that the use of the subscales is additionally useful as it allows independent use of the subscales without sacrifice of confidence in the reliability and validity. The reliabilities as measured by Cronbach's coefficient alpha are: total Dyadic Adjustment scale, .96; Dyadic Consensus Subscale, .90; Dyadic Cohesion Subscale, .86. Evidence for content, criterion-related and construct validity are presented by the author with effects significant ($p < .001$ level for the latter two types of validity.

The Hospital Stress Scale (Volicer& Bohannon, 1975). Using this scale, psychological stress due to the experience of hospitalization can be quantified. Each patient was asked to identify from a list of 49

frequently experienced events those events which he personally has experienced since coming to the hospital. Each event has a score attached to it which indicates the amount of stress caused by that event relative to the other events on the scale as perceived by a large number of hospitalized patients. A hospital stress score can be calculated for each patient by summing the scores of the events he has experienced. Factor analysis of the total scale has yielded nine clusters of items such that nine factor stress scores also can be derived by summing the scores for all items within each factor separately. The factors include: unfamiliarity of surrounding, loss of independence, separation from spouse, financial problems, isolated from other people, lack of information, threat of severe illness, separation from family, problems with medications.

Fear of Surgery Scale (Martinez-Urrutia, 1975). The FSS was devised to measure individual differences in anxiety aroused for a specific situation, surgery. The question is framed as follows: "In general, how much fear or concern do you have about surgical operations?" The patients were instructed to rate themselves on a six point scale which ranged from "no fear" to "extreme fear."

McGill Pain Questionnaire (Melzack, 1975). The MPQ consists of 20 subscales divided into three major classes of adjectives: the sensory, affective and evaluative scales. There are also four miscellaneous descriptors which have been found useful in pain description, but which did not fit the categories delivered by the other three scales.

The ten subscales of the sensory scale describe the quality of pain in terms of thermal, spatial pressure, temporal, dullness and tenderness. The five affective subscales describe tension, autonomic arousal, fear, punishment, and miscellaneous aspects of the pain experience. The evaluative scale contains descriptors designed to describe the overall intensity of the pain experience. A composite score may also be derived by summing (across subscales) the scores of all of the adjectives chosen (PRI). The patient was also asked to rate his pain at the time of testing on a five point scale from "mild" to "excruciating" (PRI) and, using the same scale, to rate his worst pain experienced thus far on that day.

Present Affect Reactions Questionnaire (Endler, 1976). The PARQ consists of 24 modes of response to the instruction, "Please circle a number from 1 to 5 for each of the 24 items to indicate how you feel at this particular moment." On this measure of State Anxiety, the patient rated the intensity of his personal experience of the 24 anxiety responses ranging from "not at all" to indications of "very much."

The Depression Adjective Check List (Lubin, 1967). The seven equivalent lists of the DACL are useful primarily as measures of subjective depressive mood. The measures may be used to study the effects of an intervention and, daily mood fluctuaton over an extended period.

Recovery Inventory (Wolfer and Davis, 1970). This scale is a measure of recovery from surgery as perceived by the patient. He

was asked to rate himself on 9 items from 0 (very poor) to 5 (excellent).

Behavioral Measures

Behavioral Pain Rating Scale (Fordyce, Fowler, Lehmann, Delateur, Sand, and Treischman, 1973). Each patient was observed twice a day for five minutes and rated by a blind observer for the presence or absence of seven behavioral indicators of pain. The observer, using the same seven criteria, interviewed the nurse's aide assigned to the patient in order to obtain a more complete picture of the patient's behavior.

The following behavioral measures were also obtained from the patient's chart: number of post-surgical days and the amount of pain medications, sleep medications, muscle relaxers and tranquilizers taken. Two methods were used to tabulate medication. First, the medications were divided into groups: 1) pure narcotic analgesics (i.e., morphine, demerol); 2) combination narcotic analgesics (medications which contained a narcotic combined with other ingredients such as Tylenol #4); 3) non-narcotic medications (Aspirin); 4) sleep medications (i.e., Dalmane); 5) muscle relaxers (i.e., Robaxin) and tranquilizers (i.e., Valium). Tranquilizers were included in this group because they are frequently prescribed as a muscle relaxer for persons having back pain. The first method of tabulation was the number of times the drugs in each of the five categories were administered in a single day, regardless of dosage.

Secondly, a narcotic potency measure was tabulated for each patient. The potency measure represents the equivalent dosage of narcotic analgesic taken, based on morphine sulphate as the comparison measure. "The potency measure was based on equivalent dosage data presented by Gebhart (1977) and as cited in the Physician's Desk Reference (1980). Dosage equivalence was based on the total amount of narcotic analgesic received, intra-muscularly and orally, in pure or combination form (i.e., Tylenol #4 contains 60 mg. of codeine which is approximately 10 mg of morphine)" for each post operative day (Scott, 1981, p. 48). (See Table 1.)

Manipulation Checks

In both experimental groups, the patient and his wife rated how useful they felt the pleasant imagery intervention was in reducing pain and in fostering relaxation in the patient. Each patient in the two intervention groups kept a record of the number of times he practiced the imagery technique.

Procedure

The names of potential subjects and their surgeons were obtained from the surgery schedule. Marital status and medical history relative to the scheduled operation was obtained from the patient's chart. The principle investigator assigned each suitable patient to one of the three groups and then approached each patient and his wife as early as possible in the afternoon on the day prior to surgery. The Experimenter's introductory comments were specific to the group to which the patient had been assigned, but in each case contained basic

Table 1

Analgesic Potency Conversion Table*

Narcotic Analgesic	Usual Therapeutic Dose (mg)	Potency (Morphine = 1)
Morphine	10 - 15 (Im)	1
Codeine	30 - 60 (oral)	0.16 - 0.33
Demerol	50 - 100 (Im)	0.1
Oxycodone (in Percodan)	10 - 20 (oral)	0.48 - 0.99
+Propoxyphene napsylate (in Darvocet-n)	50 - 100 (oral)	.10 - .20

*Taken from Gebhart, G. F. Narcotic and non-narcotic analgesics for pain relief, In Pain, a source book for nurses and other health professionals, Ada K. Jacox, Ed., Boston: Little, Brown and Company, 1977, unless otherwise designated.

+Csaky, T. Z. Cuttings handbook of pharmacology: The actions and uses of drugs. New York: Appleton-Century-Crofts, 1978.

information about the nature and purpose of the study and the general requirements of participation. The introduction was presented extemporeously and dialogue between patient, spouse and experimenter was encouraged. The content of the experimenter's initial comments may be seen in the Appendix.

Additionally, for those patients in the experimental groups who were to be taught the relaxation intervention, the relationships between pain, anxiety and relaxation were briefly stated. For the spouse-assisted group, the importance of active involvement of the spouse was explained. The remarks to the experimental groups at this time were confined to those necessary to enlist their participation and obtain consent. A more complete explanation of the intervention followed the signing of the consent form and the completion of the questionnaires.

After agreeing to participate in the study and signing the consent form, each patient and spouse completed the following measures: Dyadic Adjustment Scale (two subscales); McGill Pain Questionnaire (MPQ patient only); Fear of Surgery Question (FSQ); Present Affect Reaction Questionnaire (PARQ); Depression Adjective Check List (DACL); Hospital Stress Scale (patient only); and the Daily Pain Rating Scale (patient only). The measures given on each day may be seen in Table 2.

An appointment was made with each patient to return later in the day, usually after visiting hours. This was to control for or provide the time the experimental groups would need to read the instruction

Table 2

Overview of Psychological Measures Administered

to Both Patient and Spouse by Day

	Husband	Wife
Day One Intervention, 1	Dyadic Adjustment Scale Subscales (DCS) Fear of Surgery Question (FSQ) Present Affect Reactions Questionnaire (PRAQ) Depression Adjective Check List (DACL) McGill Pain Pain Questionnaire (MPQ) Daily Pain Ratings Hospital Stress Scale (HSS)	Dyadic Adjustment Scale Subscales Fear of Surgery Question Present Affect Reactions Questionnaire Depression Adjective Check List
Day Two		Present Affect Reactions Questionnaire Depression Adjective Checklist
Day Three Intervention, 2	Present Affect Reactions Questionnaire Depression Adjective Checklist McGill Pain Questionnaire Daily Pain Rating Recovery Inventory Behavioral Pain Ratings	Present Affect Reactions Questionnaire Depression Adjective Checklist

Table 2 (continued)

Day Four	Dyadic Adjustment Scale	Dyadic Adjustment Scale
	Fear of Surgery Question	Fear of Surgery Question
	Present Affect Reactions Questionnaire	Present Affect Reactions Questionnaire
	Depression Adjective Checklist	Depression Adjective Checklist
	McGill Pain Questionnaire	Manipulation Checks
	Daily Pain Ratings	
	Hospital Stress Scale	
	Recovery Inventory	
	Behavioral Pain Ratings	
	Manipulation Checks	
Day Five to Discharge	Present Affect Reactions Questionnaire	Present Affect Reactions Questionnaire
	Depression Adjective Checklist	Depression Adjective Checklist
	McGill Pain Questionnaire	
	Daily Pain Ratings	
	Recovery Inventory	
	Behavioral Pain Ratings	

book for the use of the calm scene. The completion of the questionnaire and the setting of the later appointment concluded the first session for the control group. The wives were not present for the second session so an appointment was made to see them the next day in the surgery waiting room during their husband's surgery. At that time they completed the PARQ and DACL.

The format for the control group for the second session on the day prior to surgery was designed to control for the time spent with the experimental groups. No specific information about relaxation or the surgical procedure was given.

When the therapist-assisted group had completed the questionnaires, a full explanation of the intervention was given to the patient. All of the comments and questions were directed toward the patient; no effort was made to include the spouse.

The intervention explanation given to the patient was based on the Gate Control Theory of Pain (Melzack and Wall, 1965) but were nontechnical in content. The explanation included:

1. The basic idea that pain begins with damage to the body which sends a pain message to the brain.

2. The pain message, then passes through a mechanism that works like a gate.

3. If the pain gate is open, the message is received by the brain and pain is experienced.

4. The gate can be partially or totally closed.

5. When the gate is closed, the pain messages are partially or totally blocked and the experience of pain is reduced or eliminated.

6. It was stressed that the imagery technique to be taught was designed to help the individual effect gate closure and thus reduce his perceived pain.

Handouts of a schematic representation of the components of the gate control theory and an outline of factors that affect the pain gate's opening and closing were utilized in order to make this explanation clear (see Appendix).

The appointment with the patient later in the day was then confirmed. An appointment was made with each spouse at that time for the next day during the husband's surgery. At that time the spouse completed the PARQ and DACL.

The second session with the patients in the therapist-assisted group was the formal relaxation training session. It began with the experimenter making sure that the patient understood the theoretical basis for the intervention in general and the task of developing a pleasant scene. Each patient was asked to identify a situation that was pleasant and relaxing for him. This situation was then elaborated on in developing a script that was presented to the patient as the "emotive imagery" relaxation scene script. Because the development of the scene was individualized, the length and format of this phase of the training varied depending on the individual. Frequently it was not necessary to utilize the portion of the training format which asked the patient to visualize a scene for 20 seconds. If the patient readily

began to describe what he liked to do to relax, then the scene development proceeded directly. The length of time an individual was seen for scene development varied from 15 minutes to 30 minutes depending on how quickly he could identify a "pleasant imagery" and utilize it in the session. The procedure for the practice session with the developed script was constant across subjects and included four segments timed with a stop watch: two, one minute visualization segments; one three minute and one five minute visualization segment. Visualization ratings were taken after the first three segements and at the conclusion of the last segment. The experimenter asked the patient to rate visualization, relaxation and pain. The scales were presented to the patient on index cards (see Appendix). The complete training format may be seen in the Appendix.

The experimenter gave encouraging feedback to the patient regardless of his ratings and noted that visualization was a skill that would improve with practice and that increased relaxation would occur as his skill increased. "Closing the pain gate" was a phrase frequently used during the session.

The patient was instructed to use the scene when he was in pain or feeling anxious, but at least three times a day. He was shown how to use a daily practice log and asked to keep a record of his practice sessions (see Appendix). The experimenter provided a written copy of the scene in its final form to the patient for the patient to keep at bedside.

For the second experimental group (relaxation training with spouse involvement--spouse-assisted group) the basic format of the first session was similar to that of the therapist-assisted group except that the wife was actively included in the information giving segment and her role as the future "coach" or relaxation therapist was explained. Because none of the wives could remain past visiting hours on the day prior to surgery, they were not present for the training which took place during the second session which followed the format outlined for the therapist-assisted group above. An appointment was made to meet with each wife during their husband's surgery. At this time they completed the PARQ and DACL and were instructed in the theoretical basis of the use of the calm scene. The experimenter modeled reading part of the scene beginning with "take a deep breath . . ." and encouraged but did not try to force the spouse to read aloud. The minimum requirement of the spouse being able to read the entire scene silently was met by all spouses. All spouses easily grasped the idea of reading in a clear, calm slow voice, as if, noted one, "I were reading a child to sleep." The spouses were also instructed in helping their husbands keep their practice logs, encouraged to read the calm scene to their husbands and to remind them to imagine the scene on their own. The importance of practicing at least three times a day and when in pain or anxious was underscored. The wives were also told that they would be in charge of the second training session on the day after surgery and the format of that session was explained. Each spouse agreed to conduct the relaxation session.

On the day of surgery, no formal contact was made with any subject. In each case, however, the experimenter visited the subject and his wife, after the surgery in the patient's room, briefly as a courtesy.

On the first day after surgery, all patients were asked to complete the McGill Pain Questionnaire, the PARQ, the DACL, Daily Pain Rating Scale and the Recovery Index. Each spouse was asked to complete the PARQ and DACL.

For the therapist-assisted group after the family had left, the experimenter reinstated the concepts presented in the presurgical training sessions. The calm scene was presented twice allowing three minutes then five minutes for visualization and relaxation. The patient was asked to rate his visualization after each presentation and his level of pain and relaxation after the five minute segment (see Appendix).

For the spouse-assisted group, the theoretical concepts were reinstated and the wife instructed in how to conduct the relaxation practice and then asked to do so. She used the same format as the Experimenter did with the therapist-assisted group and collected the visualization, relaxation, and pain ratings as appropriate for the three and five minute segments.

On the second day after surgery (the fourth day of the study) all patients and spouses were asked to complete the same psychological questionnaire they had in the first session. Additionally, all patients were asked to complete the Recovery Inventory and experimental patients and wives were asked to complete a form which rated how

useful they found the Calm Scene to be in reducing pain and fostering relaxation (see Appendix).

From the third day after surgery until the day of discharge, patients were asked to complete the McGill, PARQ, DACL, Recovery Inventory and the Daily Pain Rating. The spouses in all groups completed the PARQ and DACL. If a patient's spouse did not come to the hospital on a given day, she was called by the experimenter and the appropriate measures were completed by telephone.

On the day of discharge the experimental groups were again asked to complete the questionnaires dealing with the usefulness of the relaxation technique. Additionally, the wives in the spouse-assisted group were asked to recall, from memory, what they could about their husband's calm scene and allow their response to be taped (see Appendix).

Both experimental groups were asked daily if they had practiced the calm scene and if their logs had not been completed, the experimenter noted in the logs the number of times the calm scene had been practiced. All logs were collected on the day of discharge.

Objective behavioral pain ratings were made twice daily on all patients in each group at approximately 9:00 A.M. and 9:30 P.M. A Psychology intern or psychiatric nurse observed the patient for five minutes at each hour, rated him on a Pain Behavioral Rating Scale for the presence or absence of seven pain related behaviors (see Appendix), and then interviewed the nurse aide assigned to that patient using the same rating scale. Because there is a number of

missing observations per day, ratio scores were computed for each behavior, the A.M. and P.M. data from the observer and the nurses aide was summed and divided by the number of possible observations for that behavior for that day.

Results

Summary of Data Analyses and Pre-surgical Treatment Comparisons

Due to the use of multiple measures of pain response in this study, correlations among these measures were examined for the pre-operative day and for the first, second, and third days after surgery. Additionally, the correlation of psychological measures was examined. Correlations between the wives' psychological measures and the husbands' measures were also examined. Following these correlations, analysis of variance was utilized to test the major hypotheses. There were no covariates as chi square and analyses of variance revealed no significant, relevant differences between groups. The chi square analyses of the data pertaining to surgeon, type of surgery (cervical or lumbar laminectomy), duration of back pain, and those receiving workman's compensation insurance, revealed no significant difference between treatment and control groups. One-way analyses of variance were utilized to examine treatment group differences for age, education, hospital stress, fear of surgery (FSQ), anxiety (PARQ), depression (DACL), dyadic cohesion and consensus (DCS), and pain as reported on the McGill Pain Questionnaire (MPQ).

Comparisons were made between the experimental and control groups on the wives' scores on dyadic cohesion and consensus (DCS), anxiety (PARQ), depression (DACL), and fear of surgery (FSQ) utilizing analyses of variance. A group difference was found on dyadic consensus and cohesion (DCS) with only the wives in the therapist-assisted group scoring significantly lower than the spouse-

assisted or control groups (Duncan Multiple Range Test; 2, 2l, $p < .05$). There was also a group difference in wives' report of fear of surgery (FSQ) with wives in the therapist-assisted intervention group reporting less fear than the spouse-sssisted or control groups (Duncan Multiple Range Test; 2, 2l, $p < .05$).

The data for both husbands and wives were first examined by one way analysis of variance for treatment groups. Where there was missing data, the General Linear Models procedure of the SAS computer package (SAS, 1979) was used as it is appropriate for the analysis of unbalanced data. To examine treatment effects, planned comparisons were performed comparing first the combined experimental groups with the control group and then the two experimental groups. When cell sizes were equal, comparisons were calculated using the cell means. When the cell sizes were unequal, the calculation of the F values for each comparison involved use of the harmonic mean cell size (Keppel, 1973). The data were also examined by a series of analyses of variance. First, a 2 x 3 x 2 and a 2 x 3 x 3 were performed where the levels were sex, treatment groups with the number of days as a repeated measure. Dependent measures in these analyses included those shared in common by husband and wife (DCS, PARQ, PARQ and DACL). Second, for husbands data, 3 x 2 and 3 x 3 analyses were performed where the levels were treatment groups with number of days as the repeated measure. The dependent variables in these analyses were those the husband received that were unique to those days.

An additional 3 x 3 analysis of variance, where the levels were groups with days as a repeated measure, was used to examine the husband's post-surgical data for the first, second and third days after surgery.

Analysis of variance was utilized to examine group differences in the number of post-surgical days in the hospital and differences in the total number of times the subjects in the experimental groups practiced the interventions.

Finally, t-tests were used to examine group differences in husbands' and wives' rating of the usefulness of the interventions.

Treatment Group Comparisons on Rated Intervention Usefulness and Practice, and Number of Post-surgical Hospital Days

The t-tests between treatment groups on the rated usefulness of the interventions for relaxation and pain reduction among husbands, showed no significant difference. There was also no significant difference between groups in how useful the wives perceived the interaction to be for their husbands for relaxation or pain reduction. Additionally, there was no difference in husbands and wives finding either intervention (with or without spouse assistance) useful for both relaxation and pain reduction. Moreover, there was no significant difference in the number of times each group practiced the intervention. There was no significant difference in the number of days each group remained in the hospital post-surgically.

Correlations Among Dependent Measures

Relationships among measures of affective functioning, fear of surgery, spouse adjustment, hospital stress, verbal reports of pain, and behavioral measures of pain were examined for the pre-surgical day and for three post-surgical days. Table 3 presents the correlations among the measures given pre-surgically. Tables 4, 5, and 6 present the correlations among the post-surgical measures taken on post-surgical days one, two and three, respectively. Of particular interest here is the pattern of correlations as they relate verbal and behavioral measures of pain as well as indicating how patterns change over the course of post-surgical recovery.

Correlations Among Dependent Measures for the Pre-operative Day

Based on the correlations among psychological and pain measures, anxiety (PARQ) and depression (DACL) are related to verbal pain reports on the pre-surgical day. Anxiety (PARQ) is correlated with the McGill Pain Questionnaire subscales of the PRI and the PRI total but not with intensity ratings. Depression (DACL) is more evenly divided between the PRI (two correlations) and the intensity scales (three correlations). Dyadic consensus and cohesion (DCS) and patient perceived hospital stress do not correlate significantly (except for one intensity rating each) with verbal pain reports on the day prior to surgery. Fear of surgery (FSQ) does not correlate with any of the pre-surgical pain measures.

Table 3

Correlations Among Verbal Report Measures of Anxiety, Depression, Fear of Surgery,

Dyadic Cohesion, Hospital Stress, and Pain on the Pre-Surgical Day

	Sens	Affe	Eval	Misc	PPI	Worst	Lying	Sitting	Standing	Walking	Total Pain (PRI)
PARO	.43*	.41*	.43*	.56**	.37	.14	.17	.35	.13	.37	.49*
DACL	.27	.52**	.48*	.35	.26	.17	.43*	.51**	.36	.44*	.35
FSQ	.25	.04	.12	.31	.13	-.15	-.14	.37	-.23	-.02	.24
DCS	-.05	.37	.21	-.03	.08	.06	.48*	-.09	.24	.16	.04
Hospital Stress	-.26	-.22	-.22	-.04	-.14	.09	-.16	.02	-.44*	-.33	-.23
Sensory		.69***	.62***	.80****	.30	.41*	.22	.23	.31	.47*	.97****
Affective			.70****	.58**	.46*	.25	.48*	.34	.41*	.49**	.75****
Evaluative				.71****	.61**	.01	.40*	.24	.53**	.59**	.74****
Miscellaneous					.37	.16	.32	.24	.23	.34	.88****
PPI						-.40*	.25	.09	.26	.39	.37
Pain Worst							.14	.33	.19	.33	.34
Pain Lying								.39	.60**	.40*	.30
Pain Sitting									.34	.52**	.25
Pain Standing										.80****	.34
Pain Walking											.51**

*$p < .05$
**$p < .01$
***$p < .001$
****$p < .0001$

Table 4

Correlations Among Verbal Report Measures of Anxiety, Depression, Recovery, and Pain; Drugs and Behavioral Ratings of Pain on the First Post-Operative Day

	Sens	Affe	Eval	Misc	Total	PPI	Worst	Lying	Sit	Stand	Walk	Recv	NARC	Combo	NARCP	NonA	Sleep	MR&T	Moan	Gasp	ProW	Verb	Facl	Inter	RefW
PARQ	.25	.51**	.03	.42*	.34	.62***	.06	.32	.13	.27	.39	-.58**	.41*	.11	.49*	.00	.26	.20	.13	.16	-.01	.35	.17	.32	.17
DACL	.61***	.81****	.38	.61***	.70****	.64***	.29	.44*	.47*	.50**	.56**	.73****	.35	.22	.46*	.00	.15	.41*	.45*	.20	.18	.51**	.41*	.48*	.32
Sensory		.80****	.66***	.74****	.97****	.52**	.29	.45*	.33	.24	.28	-.50**	.24	.15	.33	.00	-.10	.32	.36	.34	.61**	.57**	.29	.43*	.19
Affective			.49*	.73****	.88****	.71****	.26	.41*	.32	.37	.37	-.62***	.34	.22	.51**	.00	.02	.38	.53**	.39	.44*	.61**	.51**	.62***	.38
Evaluative				.50**	.68***	.37	.18	.33	.20	.10	.12	-.37	.23	.23	.44*	.00	-.32	.29	.12	.07	.46*	.40*	.43*	.39	.12
Miscellaneous					.85****	.51**	.03	.19	.22	.37	.31	-.51**	.18	.32	.34	.00	.01	.24	.13	.32	.54*	.49**	.41*	.56**	.18
Total Pain (PRI)						.59**	.24	.42*	.32	.30	.32	-.56**	.27	.21	.40*	.00	-.09	.34	.36	.36	.61**	.61**	.39	.53**	.24
PPI							.16	.37	.01	.18	.35	-.46*	.33	.21	.54**	.00	.25	.55*	.29	.35	.20	.43*	.34	.52**	.26
Pain Worst								.26	.55**	.47*	.40	-.23	.37	.08	.29	.00	.00	.32	.23	.09	.04	.32	.13	.16	.35
Pain Lying									.25	.21	.29	-.54**	.43*	-.24	.39	.00	-.08	.43*	.48*	-.29	.41	.44*	.05	.18	.51**
Pain Sitting										.64***	.46*	-.39	.38	.07	.29	.00	.21	.08	.25	.26	.32	.52**	.32	.24	.28
Pain Standing											.76****	-.37	.26	.38	.26	.00	.17	.25	.17	-.22	.19	.29	.13	.46*	.27
Pain Walking												-.59**	.15	.10	.14	.00	.16	.05	.00	-.06	.27	.39	-.04	.12	.33
Recovery Index													-.58**	.13	-.47*	.00	.04	-.15	-.64***	.19	-.28	-.39	-.26	-.46*	-.48*
Narcotics														-.26	.82****	.00	.09	.27	.44*	-.36	-.06	.28	.10	.33	.53**
Combination Drugs															.12	.00	.23	.30	-.18	.11	.25	.12	.23	.21	-.28
Narcotic Potency																.00	.15	.42*	.29	-.17	.19	.54**	.35	.44*	.47*
Non-Narcotic Drugs																	.00	.00	.00	.00	.00	.00	.00	.00	.00
Sleep Medication																		.01	-.12	-.01	-.31	.09	-.22	-.10	-.18
Muscle Relaxers and Tranquilizers																			.32	.12	.27	.24	.23	.33	.43*
Moans																				-.07	.00	.14	.23	.37	.65***
Gasps																					-.04	.08	.28	.17	-.14
Protected Walking																						.81****	.31	.20	.22
Verbal Complaints																							.50*	.32	.23
Facial Expression																								.61**	.15
Interrupted Activities																									.12
Refusal to Walk																									

*p < .05
**p < .01
***p < .001
****p < .0001

Table 5

Correlations Among Verbal Report Measures of Anxiety, Depression, Fear of Surgery, Dyadic Cohesion, Hospital Stress

Pain, and Recovery, Drugs; and Behavioral Ratings of Pain on the Second Post-Operative Day

	Sens	Affe	Eval	Misc	Total	PPI	Worst	Lying	Sit	Stand	Walk	Recv	NARC	Comb	NARCP	NonA	Sleep	MR&T	Moan	Gasp	ProW	Verb	Facl	Inter	RefW
PARQ	.46*	.41*	.26	.39	.45*	.01	.16	.14	.41*	.57**	.61**	-.32	.37	.28	.58**	-.36	.25	.15	.29	.24	-.03	.28	.20	.45*	.05
DACL	.54**	.39	.12	.45*	.49*	.07	.44*	.20	.25	.30	.56**	-.63***	.49*	.01	.42*	-.23	.35	.29	.66***	.31	.17	.39	.39	.58**	.12
FSQ	-.09	-.20	.37	-.32	-.20	-.28	.35	-.14	.05	-.26	-.15	-.38	-.11	.04	-.01	.19	-.13	.10	.19	.04	.15	-.11	.07	-.12	-.17
DCS	-.02	.03	-.06	.13	.01	-.17	-.36	-.16	.02	.29	.23	.26	.16	-.08	-.04	-.24	.30	-.44*	.05	.02	-.14	-.07	-.14	.11	-.08
Hospital Stress	.26	.05	-.02	.12	.17	-.07	.28	.08	.06	.00	.06	-.29	.38	-.03	.16	.15	.12	.04	.22	-.02	.06	.14	.27	.15	-.25
Sensory		.81****	.67***	.84****	.97****	.59**	.57**	.61**	.27	.54**	.52**	-.27	.43*	.14	.22	.10	.48*	.24	.18	.02	.18	.64***	.21	.69***	.44*
Affective			.74****	.69***	.88****	.65***	.36	.43*	.01	.56**	.48*	.05	.27	-.10	.11	-.18	.57**	.20	.11	-.02	.13	.30	.10	.69***	.62***
Evaluative				.71****	.78****	.62***	.31	.40*	-.06	.40*	.32	.15	.24	.00	.27	-.04	.43*	.14	-.04	.07	.30	.28	.16	.54**	.53**
Miscellaneous					.90****	.58**	.34	.49**	.14	.46*	.41*	-.19	.48*	-.10	.21	.08	.51**	.31	.29	.13	.21	.63***	.40*	.65***	.37
Pain Total (PRI)						.66***	.49*	.57**	.17	.55**	.51**	-.16	.42*	-.12	.22	.04	.54**	.26	.18	.04	.22	.58**	.25	.72****	.51**
PPI							.38	.73****	.15	.38	.42*	.11	.25	-.21	.10	.04	.31	.37	-.09	-.32	-.21	.08	-.06	.51**	.49*
Pain Worst								.55**	.36	.27	.40	-.64***	.40*	-.21	.24	.27	.13	.08	.19	.25	.16	.38	.33	.59**	.37
Pain Lying									.39	.52**	.61**	-.16	.21	-.07	.28	.22	.05	.46*	.07	-.13	-.45*	.29	-.05	.51**	.51**
Pain Sitting										.52**	.48*	-.33	.16	.06	.27	-.11	.15	.02	.00	.19	-.16	.32	.11	.19	-.03
Pain Standing											.93****	-.02	.03	.32	.35	-.35	.40*	.12	-.01	.21	-.22	.23	-.04	.51**	.56**
Pain Walking												-.24	.22	.14	.38	-.42*	.41	.13	.15	.25	-.29	.15	.01	.73****	.59**
Recovery Index													-.57**	.11	-.31	-.03	.06	-.14	-.43*	-.41*	-.29	-.51**	-.61**	-.38	.09
Narcotics Combination														-.34	.36	-.11	.14	.14	.33	.03	.25	.44*	.64***	.67***	-.11
Drugs															.64***	-.21	-.28	.45*	.10	-.03	-.01	-.01	.04	-.26	-.04
Narcotic Potency																-.22	-.12	.56**	.39	.01	-.02	.20	.38	.28	-.05
Non-Narcotic Drugs																	-.29	.03	-.14	-.16	-.20	.09	-.08	-.22	-.12
Sleep Medications																		-.20	.25	.22	.21	.06	.07	.39	.23
Muscle Relaxers & Tranquilizers																			.38	-.23	-.16	.22	.24	.17	.09
Moans																				.27	.13	.30	.55**	.34	.00
Gasps																					.17	.25	.41*	.25	.22
Protected Walking																						.35	.34	.02	-.21
Verbal Complaints																							.53**	.44*	.17
Facial Expression																								.45*	-.07
Interrupted Activities																									.61***
Refusal to Walk																									--

*p < .05
**p < .01
***p < .001
****p < .0001

Table 6

Correlations Among Verbal Report Measures of Anxiety, Depression, Recovery, and Pain; Drugs and Behavioral Ratings of Pain on the Third Post-Operative Day

	Sens	Affe	Eval	Misc	Total	PPI	Worst	Lying	Sit	Stand	Walk	Recv	NARC	Comb	NARCP	NonA	Sleep	MR&T	Moan	Gasp	ProW	Verb	Facl	Inter	RefW
PARQ	.56**	.70***	.52**	.50*	.63***	.32	.58**	.34	.54**	.69***	.65***	-.73****	.29	.41*	.58**	.02	.44*	.20	.30	.00	.06	.30	.15	-.07	.10
DACL	.44*	.55**	.38	.37	.49*	.17	.29	.22	.32	.43*	.43*	-.58**	.20	.30	.42*	-.07	.38	.19	-.11	.00	.17	.36	.16	.15	.19
Sensory		.84****	.60**	.71****	.94****	.21	.41*	.02	.46*	.50**	.63**	-.40*	.41*	-.07	.17	.01	.24	.03	.34	.00	.05	.08	.36	-.01	.01
Affective			.61**	.77****	.93****	.35	.51**	.11	.52**	.66***	.65***	-.50**	.31	.03	.23	-.14	.33	.09	.28	.00	.06	.10	.28	.08	.06
Evaluative				.67***	.73****	.67***	.50*	.31	.55**	.66***	.67***	-.55**	.16	.25	.35	-.15	.58**	.24	.09	.00	-.04	.25	.20	.05	-.11
Miscellaneous					.89****	.39	.60**	.00	.40	.54**	.55**	-.56**	.36	-.12	.06	-.16	.37	.28	.08	.00	-.21	.03	.11	.22	.08
Total Pain (PRI)						.37	.54**	.06	.51**	.62**	.68***	-.53**	.39	-.04	.18	-.09	.36	.14	.25	.00	-.03	.09	.28	.09	.03
PPI							.28	.67***	.67***	.71****	.38	-.42*	-.05	.36	.38	-.24	.43*	.44*	-.10	.00	-.38	.04	-.12	.02	-.15
Pain Worst								.21	.42*	.57**	.68***	-.63***	.35	.25	.48*	.02	.41*	.37	.39	.00	-.03	.28	.31	.23	.31
Pain Lying									.74****	.59**	.34	-.39	-.26	.65***	.45*	-.17	.50**	.45*	-.08	.00	-.22	.15	-.07	-.10	-.18
Pain Sitting										.83****	.73****	.50**	-.26	.52**	.32	-.12	.53**	.23	.18	.00	-.07	.05	.21	.12	-.03
Pain Standing											.83****	-.61**	-.06	.47*	.45*	-.19	.43*	.33	.21	.00	.05	.18	.12	.10	.15
Pain Walking												-.63***	-.04	.34	.26	-.09	.38	.12	.42*	.00	.29	.28	.43*	.32	.20
Recovery Index													-.26	-.28	-.38	-.15	-.35	-.25	-.11	.00	.11	-.45*	-.08	-.29	.03
Narcotics														-.33	.36	.20	-.01	.18	.34	.00	-.23	.33	.09	-.09	-.14
Combination Drugs															.71****	-.26	.49*	.44*	-.13	.00	.28	.26	.23	-.14	.25
Narcotic Potency																-.02	.44*	.55**	.12	.00	.10	.47*	.20	-.24	.19
Non-Narcotic Drugs																	-.20	-.40	.31	.00	-.03	.18	-.08	.08	-.08
Sleep Medications																		.31	-.07	.00	.04	.31	.22	.05	.15
Muscle Relaxers and Tranquilizers																			-.27	.00	-.19	.26	-.09	.03	.18
Moans																				.00	.26	.12	.53**	.10	-.10
Gasps																					.00	.00	.00	.00	.00
Protected Walking																						.38	.60**	.26	.41
Verbal Complaints																							.22	.41	-.02
Facial Expressions																								.35	.31
Interrupted Activities																									.23
Refusal to Walk																									--

*p < .05
**p < .01
***p < .001
****p < .0001

The verbal report pain scales are interrelated and thus form a verbal pain dimension. Specifically, all of the descriptive subscales of the McGill PRI (sensory, affective, evaluative, and miscellaneous) correlate with each other and the PRI total. Present Pain Intensity (PPI) is correlated with the affective and evaluative subscales and negatively correlated with PPI worst pain. Measures of PPI in different positions (lying, sitting, standing, walking) are most often correlated with themselves, affective and evaluative descriptors.

Correlations Among Dependent Measures for the First Post-operative Day

Depression (DACL) is more frequently related to the pain measures (16 of 25 correlations significant) for the first post-operative day than is anxiety (PARQ) (6 of 25 correlations significant). Narcotic potency emerged as the drug measure most often correlated with other pain responses (8 of 24 correlations significant). The McGill Pain Questionnaire subscales (sensory, affective, evaluative and miscellaneous) correlated significantly with each other, with total PPI, and (excepting evaluative pain) with Present Pain Intensity (PPI). The McGill PRI descriptors correlated with behavioral pain ratings especially verbal complaints of pain, facial expression, interruption of ongoing activity and walking in a guarded or protected manner. The affective and evaluative subscales, and the PRI Total are significantly correlated with narcotic potency. It appears that the McGill subscale scores, PRI Total and PPI are sensitive to more behavioral pain indicators on the day after

surgery at which time physical activity is limited or performed with some difficulty. Another behavioral measure, "refusal to walk" is related to the Recovery Index, number of narcotics and narcotic potency and muscle relaxers and tranquilizers. The Recovery Index is significantly, negatively correlated with numerous pain indicators. As pain measures indicate an increase in pain, patients tend to rate their recovery as poorer.

Correlations Among Dependent Measures for the Second Post-operative Day

On the second day after surgery, anxiety (8 of 25 correlations are significant) and depression (10 of 25 correlations are significant) are correlated with the pain measures. On the second post-operative day, depression is no longer much more frequently related to pain than is anxiety. Fear of surgery (FSQ), Dyadic Consensus and Cohesion (DCS) and Hospital Stress were not significantly related to pain measures on the second post-operative day. Narcotic potency is less often correlated with the verbal pain measures than on the first post-surgical day. The number of narcotic analgesics and sleep medications were more frequently correlated with verbal reports of pain on day two than day one. Sleep medications correlate slightly more frequently with the McGill subscales and PRI Total (five significant correlations) than did measures of narcotic drug use (three significant correlations). The number of narcotics requested is somewhat more often related than are other drug groups to the behavioral ratings such as verbal complaints, facial expressions and interruptions in ongoing activity.

The McGill PRI total subscales continue to be highly interrelated. By the second post-operative day, the MPQ subscales are more frequently correlated with verbal report measures of physical activity such as pain on standing and walking and behavioral ratings of physical activity such as interruption of ongoing activity and refusal to walk. These patterns of correlations are consistent with the normal increase in physical activity over the recovery period as well as the tendency of physicians to taper the potency of the narcotics given as time from surgery increases.

Correlations Among Dependent Variables for the Third Post-Operative Day

On the third post-operative day, the significant correlations cluster in verbal reports of anxiety (13 of 25 total possible correlations), depression (7 of 25 total possible correlations), pain and patient perceived recovery. Few behavioral ratings are significantly correlated with other measures.

The combined narcotic drug measures are generally unrelated to the McGill PRI subscale measures, PRI Total and PPI, but are related to the pain intensity ratings of worst pain and pain lying, sitting, and standing. Sleep medications are related to evaluative pain, PPI and PPI worst pain as well as verbal reports of pain lying, sitting, and standing.

Treatment Group Comparisons for Each Post-operative Day

The effect of treatment on post-operative pain and other recovery dependent variables were examined separately for each post-surgical day for husbands and wives.

Husbands' dependent measures for post-operative day one. Planned comparisons between the control group and the combined treatment groups were non-significant. Planned comparisons between the two treatment groups were also non-significant on all dependent measures.

Husbands' dependent measures for post-operative day two. Planned comparisons between the control group and the combined treatment groups were not significant. Planned comparisons between the treatment groups were also not significant.

Husbands' dependent measures for post-operative day three. Planned comparisons between the control group and the combined treatment groups were not significant nor were the planned comparisons between the two treatment groups significant.

Wives' dependent measures for post-operative day one, two, three. Of the measures given to the wives on the three post-surgical days, only one significant group or combined group difference was found. The therapist-assisted group reported significantly less dyadic consensus and cohesion DCS than did the spouse-assisted group $F(1, 21) = 5.18$, $p < .05$. The comparison between the two treatment groups combined and the control group on this variable was not significant.

Treatment Group Comparisons Over Days

The effects of treatment on pain and other dependent variables were examined in a series of analyses of variance with days as a repeated measure in order to discover any significant main effects for

sex and days or sex by days interactions as well as any significant group by sex or group by days interactions. Main effects for groups have been examined on individual days above.

Group comparisons for husbands and wives on the pre-surgical and second post-surgical day. A 2 x 3 x 2 analysis of variance was performed where levels were sex, group with days as the repeated measure. The dependent variables were those measures taken on the specified days that were common to husband and wife i.e., Fear of Surgery (FSQ) and Dydadic Consensus and Cohesion Scales (DCS).

For FSQ there were no significant group or day main effects or interaction effects. For FSQ there was a main effect for sex $F(1, 42) = 8.28$, $p < .01$, in that wives in general reported significantly more fear of surgery than did husbands.

For DCS there were no main effects for sex or day nor were there any significant interactions. There was a significant main effect for the group, which was explored in a previous section, showing the therapist-assisted group wives to be the lower on the DCS than in the other two groups.

Group Comparisons for Husbands and Wives on Dependent Variables for Pre-Surgical Day and the First and Second Post-surgical Day

A 2 x 3 x 3 analysis of variance was performed where the levels were sex, group with days as the repeated measure on anxiety (PARQ) and depression (DACL), which were the measures common to husbands and wives for these days.

For the dependent variable anxiety (PARQ) there was no significant group effect nor was there a significant group by sex interaction. However, there was a significant sex by day interaction $F(2, 84) = 7.46$, $p < .001$, which revealed that the husband's anxiety did not change significantly over days. On the pre-surgical day, the wives' anxiety was significantly higher than the husbands' anxiety. Also, the wives' anxiety showed significant decrease from the pre-surgical day to both post-surgical days (Duncan Multiple Range Test; 2, 84, $p < .05$). However, there were no significant differences between post-surgical days one and two. The only significant post-operative difference between husbands' and wives' anxiety occurred on the first day after surgery when husbands were more anxious than wives (Duncan Multiple Range Test; 2, 84, $p < .05$).

For depression (DACL) there was only a significant day effect $F(2, 84) = 6.49$, $p < .01$. The Duncan Multiple Range Test indicated that depression, in general for husbands and wives, declined over time with the significant differences being between the pre-operative day and the second post-operative day (Duncan Multiple Range Test; 2, 84, $p < .05$).

Group Comparisons for Husbands Only on Hospital Stress for the Pre-surgical Day and the Second Post-surgical Day

A 3 x 2 analysis of variance was performed where the levels were groups and days with days as a repeated measure. Hospital Stress is considered separately here because it is the only unique measure for husbands for this time period. The only significant main

effect was for days $F(1, 21) = 15.09$, $p < .001$. As expected, the Hospital Stress score was significantly higher at the second measurement (Duncan Multiple Range Test; 1, 21, $p < .05$).

Group Comparisons for Males Over the Pre-surgical Day and Post-surgical Days One and Two

A 3 x 3 analysis of variance where the levels were groups and days with days as the repeated measure was done for the dependent variables given only to the husband before and after surgery: The McGill Total PRI score, the PRI subscales (sensory, affective, evaluative, and miscellaneous), PPI, worst pain, and pain intensity while lying, sitting, standing, and walking. There were no significant main effects for group, day nor were there any significant group by day interactions.

Group Comparisons for Males Over Three Post-surgical Days

The data was analyzed in a 3 x 3 analysis of variance for all of the post-surgical dependent variables in order to examine main effects for days as well as any group by day interactions. Due to the presence of unbalanced data (primarily because one subject was discharged) the general linear model program was utilized as noted above. The dependent variables included: The PARQ, DACL, McGill Total PRI score, the PRI subscales (sensory, affective, evaluative, and miscellaneous), PPI, worst pain, and pain intensity while lying, sitting, standing, and walking. Data were also collected on medications taken daily in the post-operative period including the number of pure narcotic analgesics, combination of narcotic, and

non-narcotic drugs, a measure of the potency of the daily narcotic intake, non-narcotic pain relievers, sleep medications, and the number of muscle relaxers and tranquilizers considered together. Behavioral pain ratings were also made of the presence or absence of moaning, gasping, verbal complaints of pain, facial expressions denoting pain, interruptions in ongoing activity, walking in a guarded or protected manner and refusal to walk.

There was a significant main effect for days in anxiety (PARQ) $F(2, 41) = 4.15$, $p < .05$. Post hoc analysis revealed that there was a significant difference across groups between the first post-surgical day and the second and third days (Duncan Multiple Range Test; 2,41, $p < .05$). Days two and three were not significantly different from each other. Anxiety decreased over time. There was also a main effect for depression (DACL) over days $F(2, 41) = 4.38$, $p < .05$. The Duncan Multiple Range Test indicated that depression increased over time with day one significantly different from day three (2, 41, $p < .05$) but with no significant difference between day one and two or days two and three. Analysis of the data showed a significant main effect for days in worst pain intensity rating $F(2,41) = 6.32$, $p < .01$. The significant difference was a decrease in pain between the first post-operative day and days two and three (Duncan Multiple Range Test; 2, 41, $p < .05$). Post-operative days two and three were not significantly different. There was also a significant main effect for day for pain intensity while standing $F(2,40) = 6.54$, $p < .01$. Pain standing decreased over days with the

significant difference between days one and two and one and three (Duncan Multiple Range Test; 1, 40, $p < .05$). There were no differences between post-surgical days two and three.

Data analysis revealed a significant main effect for days across groups for the Recovery Index $F(2, 41) = 4.09$, $p < .05$. The Duncan Multiple Range Test (2, 41, $p < .05$) showed that there was a significant difference between post-surgical days one and two but that days one and three were not significantly different nor were post-surgical days two and three. Generally, scores on the Recovery Index increased indicating improvement in recovery as perceived by the patient.

The data analysis also revealed a significant group by day interaction for the Recovery Index $F(4, 41) = 2.87$, $p < .05$, which may be explained as follows. There were no significant changes in the Recovery Index scores of the Therapist-assisted Group or the Spouse-assisted Group over the three post-surgical days. There were no significant differences between groups on post-surgical day one. On post-surgical day two, the control group had a significantly higher Recovery Index score than on day one as well as a significantly higher Recovery Index score than either the Therapist-assisted Group or the Spouse-assisted Group on post-operative day two (Duncan Multiple Range Test; 4, 41, $p < .05$). There was no significant difference between the Recovery Index scores for the Therapist-assisted and Spouse-assisted Groups on post-operative day two. On post-operative day three, the control group showed a significant

decrease in Recovery Index score. The control group score was significantly lower than the therapist-assisted group, but not significantly lower than the Spouse-assisted Group (Duncan Multiple Range Test; 4, 41, $p < .05$). There was no significant difference difference between the Therapist-assisted and Spouse-assisted groups on post-surgical day three.

For the drug related dependent variables there were several main effects for day. The number of narcotic drugs taken significantly decreased over days $F(2, 41) = 7.56$, $p < .01$; with the difference being accounted for by day one and days two and three (Duncan Multiple Range Test; 2, 41, $p < .05$). Days two and three were not significantly different.

Although the analysis of variance revealed no significant differences for days in the number of sleep medication taken $F(2, 41) = 2.98$, $p < .10$, $> .05$; the Duncan Multiple Range Test indicated there was a significant difference, a decrease in sleep medication between post-surgical days one and three (2, 41, $p < .05$). There were no differences between days one and two or between days two and three.

Analysis of the data revealed a significant day effect for narcotic potency $F(2, 41) = 3.54$, $p < .05$. The Duncan Multiple Range Test indicated that there was a significant drop in narcotic potency across groups from post-surgical day one to post-surgical day three (2, 41, $p < .05$). There was no difference between days two and three.

Data analysis revealed a significant interaction between day and group for narcotic potency $F(4, 41) = 3.05$, $p < .05$.

Post hoc examination of that interaction revealed the following results. On day one, the Therapist-assisted Group received medication with significantly greater narcotic potency than did either the control group or the Spouse-assisted Group (Duncan Multiple Range Test; 4, 41, $p < .05$). There was no difference between the control group and the Spouse-assisted Group. On post-operative day two, the Therapist-assisted Group had a significantly higher narcotic potency score than either the Spouse-assisted Group or the control group (Duncan Multiple Range Test; 4, 41, $p < .05$). There was no difference between the control group and the Spouse-assisted group. There were no differences between the groups in narcotic potency on post-operative day three. There were no significant changes in narcotic potency across days for the control group or the Spouse-assisted Group. For the Therapist-assisted Group, there were no significant differences between post-operative days one and two, but there was a significant decrease in narcotic potency from post-operative days one to three and from post-operative days two to three (Duncan Multiple Range Test; 4, 41, $p < .05$).

Analysis of variance indicated a main effect for day for observed verbal complaints of pain $F(2, 40) = 3.49$, $p < .05$. Post hoc analysis revealed that there were fewer observed verbal complaints of pain on post-surgical day one than day three (Duncan Multiple Range Test, 2, 40, $p < .05$). There were no significant differences between days one and two and days two and three.

Analysis of the data revealed a significant group effect for facial expressions denoting pain $F(2, 21) = 4.08$, $p < .05$, with the control group exhibiting significantly fewer facial grimaces over days than the intervention groups combined $F(1, 21) = 6.76$, $p < .01$. The intervention groups were not significantly different. There was also a significant main effect for days for facial expression denoting pain $F(2, 40) = 3.74$, $p < .05$. The Duncan Multiple Range Test indicated that there were significantly fewer facial expressions denoting pain on post-surgical day three than on day two (2, 40, $p < .05$) but that neither days one and two or days one and three were significantly different.

Discussion

This study utilized multiple pain measures in an effort to assess adequately the complex pain experience without placing undue emphasis on a single component of pain. Frederiksen et al. (1978) states quite plainly that multiple measures are critical to the accurate description of pain.

Generally, multiple pain measures have involved the use of verbal reports, behavioral ratings, and physiological measures. In the present study, the following types of measures were used: verbal self reports, number and potency of medicines taken each day, and behavioral ratings based on direct observations of the patient as well as interviews with nurses aides who had contact with the patient.

Correlations Among Pain and Psychological Measures

Although the primary focus in this study was the husband's response on the dependent variables, the wife was asked to respond to the measures of dyadic consensus (DCS), fear of surgery (FSQ), anxiety (PARQ), and depression (DACL). Her responses were correlated with those of her husband in order to discover the relationship between the wife's emotional state and her husband's emotional state, pain and recovery. So few of such a large number of possible correlations were significant that it was concluded that the correlations probably occurred by chance. It appears, as measured in this study, that the wife's emotional state had little relationship to that of the patient, especially over the course of recovery. One indication of the validity of this position may be found in examining

the sex by day interaction for husbands and wives on the anxiety measure (PARQ). The husband's anxiety remained constant across the measured pre- and post-surgical days, while the wives' anxiety showed wide fluctuation. On the pre-surgical day, the wives' anxiety was significantly higher than the husbands' anxiety, but here was a significant drop in the wives' anxiety on the day after surgery such that the wives' anxiety was significantly lower than her own pre-surgical level and the husbands' post-surgical day one anxiety level. There was no difference between post-surgical days one and two. The husbands' anxiety did not show this across day pattern.

A similar lack of relationship between spouse and patient anxiety reported by Barkdall (1975). Further, Chatham (1978) reported that the wife's participation in the Intensive Care Unit care of her husband reduced the likelihood of post-cardiotomy psychosis, as expected, but did not affect the patient's anxiety, depression, agitation, or complaints. Romero (1978) reported that a pre-surgical teaching program reduced both husbands' and wives' anxiety but this conclusion was based on anecdotal data; no data analysis was performed. Doerr and Jones (1979) reported that the patients whose families had received information about Intensive Care Unit procedures had significantly lower state anxiety than those patients whose families had not been instructed. Nevertheless, no direct measures of the effect of spouse affect on patient affect was demonstrated. One can thus interpret the present findings as consistent with past literature on this issue. Spouse anxiety may be related to patient anxiety in critical situations, but that remains to be clearly demonstrated.

It is possible that the wife's anxiety, while elevated pre-surgically did not last long enough to have an effect on her husband's anxiety. Also possible, is that while the wife experienced subjective anxiety, this anxiety was not manifested behaviorly and thus was not perceived by the husband. Future studies might include behavioral measures of the emotional states of both husband and wife and thereby attempt to address this issue.

For patients, measures of fear of surgery (FSQ) dyadic cohesion (DCS) and hospital stress were not related to the pain measures either before or after surgery. Generally, anxiety (PARQ) and depression (DACL) were correlated with the pain measures on the pre-surgical day and the three post-surgical days. Depression was more apparent on the first post-operative day. Depression has not been widely considered in the surgical literature and perhaps it should be a focus in future research. It is possible that it contributes more than anxiety to post-surgical pain, at least immediately after surgery. It may be that depression and self-reported anxiety determine the drugs people request as the correlations remain constant across days. Moreover, there is a significant effect for days on depression which indicates that depression shows an increase by post-surgical day three.

Intradimensional Correlations

On the basis of the correlations among pain measures within dimensions of the three general classes (verbal reports [McGill PRI scales and intensity ratings], drug measures and behavioral ratings),

only the McGill PRI shows consistent intra-class correlations over days. Behavioral measures did not correlate consistently with themselves nor did drugs. In terms of the behavioral measures, no behavioral pain dimension was evidenced in this study. There is a possibility that such a dimension does not exist. However, due to the method for obtaining these ratings, specifically the brief time sampling (five minutes twice a day) and an interview with an untrained observer; there is low variability in these measures. Future studies should examine the behavioral ratings of trained observers taken over a longer period of time and/or at critical times such as when the patient is being required to exercise. Nurses' ratings may be the most practical way to obtain this data.

The failure to find consistent intercorrelations among drugs suggest that there may be no drug pain dimension. Rather than finding that high use of one type of medication is likely to be related to high use of another type, it appears that one type of medication is used at one point in the recovery period and another at a different point in time.

Interdimensional Correlations

Examination of the correlations between the classes of pain measures (verbal report, drug related behavior and behavioral ratings) clearly indicate that the McGill PRI was consistently correlated with other drug and behavioral measures up to the third post-operative day. At that time, self-reported pain intensity at lying, sitting and standing became the measures most consistently related to drug usage.

Behavioral pain measures were consistently weak correlates of other pain indicators. The self-report measures at this point in time appear to be the most valid indicators of the pain experience.

The daily use of the recovery index is relatively unreported in the literature. This measure shows some promise as a measure of post-surgical pain and recovery in that it correlated negatively with at least one aspect of the three classes of pain indicators at each of the three post-operative days with the exception of drugs on day three. Thus, as pain responses increase, the patient's positive perception of his recovery decreases.

Intervention Results

Contrary to expectations, there was no evidence that the imagery intervention was effective either with or without spouse assistance. The most likely reason for the failure to obtain significant results in this study is the small number of subjects in each group (8). With such a small sample, extreme scores have a disproportionate effect. This would be especially true if the sample had a larger proportion of avoiders who tend to do well on their own (Andrew, 1970; Cohen & Lazarus, 1972; Scott, 1981) and who may also report less pain.

It is also probable that the intervention occurred too close to the time of surgery. The surgery schedule was not finalized for these particular patients until after two o'clock on the afternoon before surgery, thus initial contact was not made until at least that time.

The afternoon before surgery appears to be an excellent time, when motivation is high, to obtain the patients' and wives' consent and initial cooperation as only three patients contacted declined to participate. However, it may well be too late to establish sufficient rapport or develop the education and training components of the intervention which would foster the patient's belief in the strategy and his ability to utilize it effectively on his own. Both belief in the effectiveness of the strategy and belief in one's ability would be necessary to sustain an individual effort (practice) after surgery when pain is present and medication is readily available. The lack of motivation may be reflected by the few times the calm scene was practiced during the total hospitalization ($\bar{X}$ = 4) and by the fact that the experimenter had to inquire about practice and fill out the majority of the practice logs. Several patients commented that the imagery technique was helpful when the therapist was reading the script, but not as much or not at all when they tried to utilize it alone.

The group whose wife was actively involved as a coach did not do better than the therapist-assisted group in number of times practiced or on the ratings of how useful the husband and wife perceived the intervention to be. The problem here again may be the timing of the instructions to the wife. The wife was initially, minimally involved because the first patient contact was made late in the afternoon. Due to distance from home or other responsibilities most wives could not stay past visiting hours or return later in the evening.

Earlier contact with the patients would have allowed the wife time to make alternative plans, if possible. Thus, while she heard the educational phase of the intervention and had her role explained, her special involvement was not fully clear until the day of surgery. Although the experimenter was able to meet with each wife in a private room adjoining the surgery waiting room, the wife's concentration was not as good as it might have been at a less stressful time. Moreover, the wife had no opportunity to observe the development of the imagery scene, or benefit from therapist modeling during the training phase. If the wife had been able to participate in the initial training and had been able to practice reading the scene during the pre-surgical period, she may have felt more competent and therefore more willing to encourage her husband's use of the pleasant imagery. Additionally, if the wife's role as co-therapist or "coach" were made more salient for the husband, his perception of her competence may have been enhanced so that if she suggested utilization of the scene, he may have been more willing to comply. Several wives reported that they had tried to get their husbands to practice using the scene with them, but the husbands refused.

The fact that several patients commented that the scene was effective when being read by the therapist raises two points. It may be important, especially when training time for pain-reducing strategies is minimal, to have a therapist not only encourage the use of the strategy but to actually guide its use on a daily basis. If the wife cannot be adequately involved, then other personnel would need to be

recruited. Perhaps the script could be tape recorded so that therapist time would be minimized. Frequently, patients complained that they could not concentrate alone because of the distraction in the room. Listening to the scene on tape would reduce the distraction problem.

Finally, it is possible that the emotive imagery intervention did not work because the subjects were unable to visualize the scene clearly enough to use it for relaxation and as a distractor from pain. According to Kazdin (1976b in Cormier & Cormier, 1979), individuals who cannot produce vivid images cannot be expected to benefit from an intervention based on that ability.

Lang (1979), however, has developed a theory of emotive imagery that includes a method of training unselected subjects in vivid imagination. Basically, the training involves being sure that the subject includes in his imagery script, physical-behavioral responses in addition to the stimulus details necessary to make the scene realistic, e.g., deep blue sky. Lang (1979) reported that subjects whose self-generated imagery was shaped by a therapist to contain physiological (behavioral) response propositions reported more vivid, realistic imagery than subjects whose imagery was shaped to contain only stimulus details. Thus, Lang concludes that unselected subjects can be trained to "behave in a visualization task as have subjects in other experiments who have been specially pre-selected for imagery ability" (Lang, 1980, p. 191).

The implications from Lang's work for scene development in clinical studies include patient-generated scenes which are shaped by

the therapist to include response statements as well as a sufficient number of stimulus statements to establish a realistic setting for the patient. Lang's theory influenced the procedure utilized in this study in an effort to minimize the effect of using subjects who were not preselected for imagery ability. Future studies may wish to include a pre-test of imagery ability to more closely monitor the effect of training procedures.

In all studies involving unselected populations, attention should be given to individual differences. In the present study, individual differences were assessed only in terms of group differences in fear of surgery and dyadic consensus and hospital stress. The only difference between the groups in these variables were for wives. Wives, in general, reported more fear of surgery and the wives in the therapist-assisted group reported lower marital satisfaction. Neither of these measures for either husbands or wives correlated significantly with the other dependent variables. In this study, neither contributed to our understanding of the recovery process or of the process of intervention.

Previous studies have examined coping style in an effort to discover which interventions work for whom. Most recently Scott (1981) reported that relaxation worked better than information and information plus relaxation for sensitizers; avoiders tended to recover well on their own. Pickett and Clum (in press) recommended attention distraction as the treatment of choice in surgical patients. Combining these results and evidence provided from the literature, it would

appear that patient-generated emotive imagery, because of its personalized, distracting and relaxing properties, is a reasonable choice as a pre-surgical intervention. Such was not the case in the present study. Future researchers may wish to examine the effect coping style has on the effectiveness of emotive imagery.

Conclusions and Recommendations

It is clear that emotive imagery as employed in this study, with or without the involvement of the spouse was not effective in reducing post-surgical pain, anxiety or depression. Future research should consider the need for earlier contact with the patient in order to establish rapport, identify high risk patients, and assess individual differences. A large enough sample should be used to enable division of the groups into levels of affect and coping styles. These divisions would maximize the possibility of finding treatment effects if they are in fact there, as well as adding to existing clues as to which treatment is most effective for whom.

An ideal model for research/clinical intervention would include the following stages. Early contact with the patient should be made, preferably at the surgeon's office when the decision to schedule surgery is made. This early contact should include measures to assess anxiety, depression, and coping style as well as brief information about the role of psychological interventions for the patient and, if desired, for the spouse. These measures could be part of the routine pre-surgical work-up and administered by the physician's staff. This would prepare the patient for the personal contact with the psychologist, add the explicit approval of the surgeon to the process and enable the clinician/researcher to choose an appropriate preparatory intervention or to assign the subject to an appropriate group. Under ideal conditions, intervention with the psychologist should begin on an outpatient basis, but this is not generally practical.

Shortly after admission to the hospital, the patient should be contacted by the clinician. The first visit should be limited to introductions, a brief presentation of the intervention/research plans and obtaining informed consent. An appointment can then be made to collect the necessary pre-surgical data and to begin the intervention process. Because the contact with the patient is relatively brief, usually one afternoon or evening, and close to the stressful event; the treatment should be reinstated on post-surgical days. Although more extensive pretraining would be desirable, it is not realistic for most patient populations as they are not admitted to the hospital until the day before surgery. However, if a patient population is in the hospital for more days prior to surgery, the intervention could begin earlier. This might be possible for patients scheduled for major surgeries such as open heart surgery.

Daily follow-up is important in order to discover the pattern of, pain recovery, medicine usage and affect. Some interventions may have an immediate effect while others do not have their maximum effect until later in the hospitalization.

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APPENDIX

Introduction Content

The introduction will not be read. The patient will be encouraged to ask questions in order to clarify the purpose of the study and/or the intervention. The content of the investigator's introduction will include the following information.

"My name is Judith Peoples. I am a psychologist with the Department of Behavioral Medicine and am doing some research here in the hospital with the cooperation of your surgeon. We are interested in the feelings patients and their wives have about the type of surgery you are having. We want to study the effect surgery and hospitalization has on people's feelings so we can make some recommendations about how to make future patients more comfortable before and after surgery.

We also want to learn more about wives reactions to their husband's hospitalization so that we can be of help to families in the future. I have been given permission by your surgeon, Dr. _____ to contact you, but you are, of course, free to choose whether or not you wish to participate. I want to assure you that regardless of your participation, your basic hospital care will not be affected.

Although only the patient's signature is needed on this consent form, both of you should read this information. Please let me know if you have questions.

Patient Consent Form for the Study of Patients' Reactions to Surgery

The purpose of this study is to evaluate patients' reactions to surgery. Your participation will require examination of your hospital medical records for routinely collected information such as temperature and blood pressure as well as your answering questions concerning your adjustment to the hospital and the surgical experience; the amount and type of pain, if any, you are undergoing; and the amount of emotional discomfort, if any, you are experiencing. Additionally, you and your spouse will be asked to rate the degree to which you participate in activities together. Your spouse will also be asked to respond to questionnaires dealing with mood and anxiety. These questionnaires will be administered in short daily sessions while you are in the hospital. The first and last sessions will take approximately 30 minutes; the other daily sessions will last 5-10 minutes each. No drugs or other procedure will be administered. After you return home, you will be contacted by telephone three times and encouraged to complete questionnaires that you will be asked to take home. A fourth set of questionnaires will be given to you to complete in your physician's office.

The data collected will be completely confidential. In compliance with the guidelines for the protection of research participants, the investigator guarantees the following:

1. You may terminate involvement and withdraw data at any time during the procedure;

2. all data will be kept confidential, will be coded and used only for the stated purpose;

3. at the conclusion of the study, you may obtain a copy of the summarized results.

The following statement is added to meet the requirements of University policy: "It is not the policy of the Department of Health and Human Services, other federal agencies, state institutions and agencies, and private institutions and agencies which are funding the research project in which you are participating to compensate or provide medical treatment for human subjects in the event the research results in injury."

If you are willing to participate in the study, please give your consent by signing below.

Investigator:

Judith B. Peoples
Doctoral Candidate
West Virginia University
Medical Center
Charleston Division
Department of Behavioral
Medicine and Psychiatry

Your name _____

Date _____

_____
Attending Physicians
Signature

Patient Consent Form for the Study of the Effect of Relaxation Training on Patient's Reactions to Surgery

The purpose of this study is to evaluate the effect of teaching a relaxation strategy prior to surgery on the patient's reaction to the surgery. In addition to your learning the relaxation strategy, your participation will require examination of your hospital medical records for routinely collected information such as temperature and blood pressure. You will also be asked to answer questionnaires concerning your adjustment to the hospital and surgical experience; the amount and type of pain, if any, you are undergoing; and the amount of emotional discomfort, if any, you are experiencing. Additionally, you and your spouse will be asked to rate the degree to which you participate in activities together. Your spouse will also be asked to respond to questionnaires dealing with mood and anxiety. These questionnaires will be administered in short daily sessions while you are in the hospital. The first and last sessions will take approximately 30 minutes; the other daily sessions will last 5-10 minutes each. The sessions for relaxation training will take place following the completion of the questionnaires for the two days prior to surgery and will last approximately 60 minutes for the first day and 30 minutes for the second day. No drugs or other procedures will be administered as part of this study. After your return home, you will be contacted by telephone three times and encouraged to complete questionnaires that you will be asked to take home. A fourth set of questionnaires will be given to you to complete in your physician's office when you return for your post-surgical appointment.

The data collected will be completely confidential. In compliance with the guideline for the protection of research participants, the investigator guarantees the following:

1. You may terminate involvement and withdraw data at any time during the procedure;

2. all data will be kept confidential, will be coded and used only for the stated purpose;

3. at the conclusion of the study, you may obtain a copy of the summarized results.

The following statement is added to meet the requirements of the University policy: "It is not the policy of the Department of Health and Human Services, other federal agencies which are funding the research project in which you are participating to compensate or provide medical treatment for human subjects in the event the research results in injury."

If you wish to participate in the study please give your consent by signing below. Whether or not you choose to participate in this study will in no way influence your hospital care.

Investigator:

Judith B. Peoples
Doctoral Candidate
West Virginia University
Medical Center
Charleston Division
Department of Behavioral
Medicine and Psychiatry

Your name _____

Date _____

_____
Attending Physician's
Signature

Patient Consent Form for the Study of the Effect Relaxation Training on Patients' Reactions to Surgery

The purpose of this study is to evaluate the effect of teaching a pre-surgical relaxation strategy to a patient and his/her spouse so that the spouse could serve as a "coach" and encourage the patient to employ the relaxation skill when stressed. In addition to you and your spouse learning the relaxation strategy, your participation will require examination of your hospital medical records for routinely collected information such as temperature and blood pressure. You will also be asked to answer questionnaires concerning your adjustment to the hospital and the surgical experience; the amount and type of pain, if any, you are undergoing; and the amount of emotional discomfort, if any, you are experiencing. Additionally, you and your spouse will be asked to rate the degree to which you participate in activities together. Your spouse will also be asked to respond to questionnaires dealing with mood and anxiety. These questionnaires will be administered in short daily sessions while you are in the hospital. The first and last sessions will take approximately 30 minutes; the other daily sessions will last 5-10 minutes each. The session for relaxation training will take place following the completion of the questionnaires on the day prior to surgery and the day after surgery and will last approximately 60 minutes for the first session and 30 minutes for the second session. No drugs or other procedures will be administered as part of this study. After you return home, you will be contacted by telephone three times and encouraged to complete questionnaires that you will be asked to take home. A fourth set of questionnaires will be given to you to complete in your physician's office when you return for your post-surgical appointment.

The data collected will be completely confidential. In compliance with the guidelines for the protection of research participants, the investigator guarantees the following:

1. You may terminate involvement and withdraw data at any time during the procedure;

2. all data will be kept confidential, will be coded and used only for the stated purpose;

3. at the conclusion of the study, you may obtain a copy of the summarized results.

The following statement is added to meet the requirements of University policy: "It is not the policy of the Department of Health and Human Services, other federal agencies, state institutions and agencies, and private institutions and agencies which are funding the research project in which you are participating to compensate or provide medical treatment for human subjects in the event the research results in injury."

If you wish to participate in the study please give your consent by signing below. Whether or not you choose to participate in this study will in no way influence your hospital care.

Investigator:

Judith B. Peoples
Doctoral Candidate
West Virginia University
Medical Center
Charleston Division
Department of Behavioral
Medicine and Psychiatry

Your name _____

Date _____

_____
Attending Physician's
Signature

Dyadic Consensus and Cohension Scale

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list.

	Always Agree	Almost Always Agree	Occa-sionally Disagree	Fre-quently Disagree	Almost Always Disagree	Always Disagree
1. Handling family finances	5	4	3	2	1	0
2. Matters of recreation	5	4	3	2	1	0
3. Religious matters	5	4	3	2	1	0
4. Friends	5	4	3	2	1	0
5. Conventionality (correct or proper behavior)	5	4	3	2	1	0
6. Philosophy of life	5	4	3	2	1	0
7. Ways of dealing with parents or in-laws	5	4	3	2	1	0
8. Aims, goals, and things believed important	5	4	3	2	1	0
9. Amount of time spent together	5	4	3	2	1	0
10. Making major decisions	5	4	3	2	1	0
11. Household tasks	5	4	3	2	1	0
12. Leisure time interests and activities	5	4	3	2	1	0
13. Career decisions	5	4	3	2	1	0

	All of them	Most of them	Some of them	Very few of them	None of them
Do you and your mate engage in outside interests together?	4	3	2	1	0

How often would you say the following events occur between you and your mate?	Never	Less than once a month	Once or twice a month	Once or twice a week	Once a day	More often
Have a stimulating exchange of ideas?	0	1	2	3	4	5
Laugh together?	0	1	2	3	4	5
Calmly discuss something?	0	1	2	3	4	5
Work together on a project?	0	1	2	3	4	5

Fear of Surgery Scale

In general, how much fear or concern do you have about surgical operations?

1. no fear
2. a little fear
3. some fear
4. moderate fear
5. strong fear
6. extreme fear

Date _____

Present Affect Reactions Questionnaire (PARQ)

Please circle a number from 1 to 5 on this sheet for each of the 24 items to indicate:

"HOW YOU FEEL AT THIS PARTICULAR MOMENT"

1.	Hands feel moist	1 Not at all	2	3	4	5 Very moist
2.	Feel relaxed	1 Very relaxed	2	3	4	5 Not at all
3.	Hands feel unsteady	1 Not at all	2	3	4	5 Very unsteady
4.	Feel self-confident	1 Very much	2	3	4	5 Not at all
5.	Stomach feels tense	1 Not at all	2	3	4	5 Very tense
6.	Enjoy this situation	1 Very much	2	3	4	5 Not at all
7.	Heart beats faster	1 Not at all	2	3	4	5 Much faster
8.	Feel calm	1 Very calm	2	3	4	5 Not at all
9.	Perspire	1 Not at all	2	3	4	5 Very much
10.	Feel comfortable	1 Very much	2	3	4	5 Not at all
11.	Mouth feels dry	1 Not at all	2	3	4	5 Very dry
12.	Unable to focus my thoughts	1 Able to focus	2	3	4	5 Unable to focus
13.	Feel pleasant	1 Very pleasant	2	3	4	5 Not at all
14.	Feel nervous	1 Not at all	2	3	4	5 Very nervous

15.	Feel throbbing in my head	1 Not at all	2	3	4	5 Very much so
16.	Feel secure	1 Very secure	2	3	4	5 Not at all
17.	Feel upset	1 Not at all	2	3	4	5 Very upset
18.	Hands feel cold	1 Not at all	2	3	4	5 Very cold
19.	Feel good	1 Very good	2	3	4	5 Not at all
20.	Feel anxious	1 Not at all	2	3	4	5 Very anxious
21.	Breathing is irregular	1 Not at all	2	3	4	5 Very irregular
22.	Feel uneasy	1 Not at all	2	3	4	5 Very uneasy
23.	Want to avoid this situation	1 Not at all	2	3	4	5 Very much
24.	Feel lump in throat	1 Not at all	2	3	4	5 Very much

CHECK LIST

DACL FORM A

By Bernard Lubin

Name_____ Age_____ Sex_____

Date_____ Highest grade completed in school_____

DIRECTIONS: Below you will find words which describe different kinds of moods and feelings. Check the words which describe How You Feel Now - - Today. Some of the words may sound alike, but we want you to check all the words that describe your feelings. Work rapidly and check all of the words which describe how you feel today.

1. ☐	Wilted	17. ☐	Strong
2. ☐	Safe	18. ☐	Tortured
3. ☐	Miserable	19. ☐	Listless
4. ☐	Gloomy	20. ☐	Sunny
5. ☐	Dull	21. ☐	Destroyed
6. ☐	Gay	22. ☐	Wretched
7. ☐	Low - spirited	23. ☐	Broken
8. ☐	Sad	24. ☐	Light - hearted
9. ☐	Unwanted	25. ☐	Criticized
10. ☐	Fine	26. ☐	Grieved
11. ☐	Broken - hearted	27. ☐	Dreamy
12. ☐	Down - cast	28. ☐	Hopeless
13. ☐	Enthusiastic	29. ☐	Oppressed
14. ☐	Failure	30. ☐	Joyous
15. ☐	Afflicted	31. ☐	Weary
16. ☐	Active	32. ☐	Droopy

McGill Pain Questionnaire

1. What does your pain feel like?

Some of the words I will read to you describe your pain at present. Tell me which words best describe it. Leave out any word-group that is not suitable. Use only a single word in each appropriate group--the one that best applies.

(1)	(2)	(3)	(4)
1 flickering	1 jumping	1 pricking	1 sharp
2 quivering	2 flashing	2 boring	2 cutting
3 pulsing	3 shooting	3 drilling	3 lacerating
4 throbbing		4 stabbing	
5 beating		5 lancinating	
6 pounding			

(5)	(6)	(7)	(8)
1 pinching	1 tugging	1 hot	1 tingling
2 pressing	2 pulling	2 burning	2 itchy
3 gnawing	3 wrenching	3 scalding	3 smarting
4 cramping		4 searing	4 stinging
5 crushing			

(9)	(10)	(11)	(12)
1 dull	1 tender	1 tiring	1 sickening
2 sore	2 taut	2 exhausting	2 suffocating
3 hurting	3 rasping		
4 aching	4 splitting		
5 heavy			

(13)	(14)	(15)	(16)
1 fearful	1 punishing	1 wretched	1 annoying
2 frightful	2 gruelling	2 blinding	2 troublesome
3 terrifying	3 cruel		3 miserable
	4 vicious		4 intense
	5 killing		5 unbearable

(17)	(18)	(19)	(20)
1 spreading	1 tight	1 cool	1 nagging
2 radiating	2 numb	2 cold	2 nauseating
3 penetrating	3 drawing	3 freezing	3 agonizing
4 piercing	4 squeezing		4 dreadful
	5 tearing		5 torturing

2. How does your pain change with time?

Which word or words would you use to describe the pattern of your pain?

continuous	rhythmic	brief
steady	periodic	momentary
constant	intermittent	transient

What kinds of things relieve your pain?

What kinds of things increase your pain?

3. How strong is your pain?

People agree that the following 5 words represent pain of increasing intensity.

1 mild 2 discomforting 3 distressing 4 horrible 5 excruciating

To answer each question below, write the number of the most appropriate word in the space beside the question.

1. Which word describes your pain right now? _____

2. Which word describes it at its worst? _____

3. Which word describes it when it is least? _____

4. Which word describes the worst toothache you ever had? _____

5. Which word describes the worst stomachache you ever had? _____

Pain Rating

Please rate, by circling your response, your pain today while you were:

Lying Down

1	2	3	4	5
Mild	Discomforting	Distressing	Horrible	Excruciating

Sitting in a Chair

1	2	3	4	5
Mild	Discomforting	Distressing	Horrible	Excruciating

Standing Up

1	2	3	4	5
Mild	Discomforting	Distressing	Horrible	Excruciating

Walking

1	2	3	4	5
Mild	Discomforting	Distressing	Horrible	Excruciating

Hospital Stress Scale

Each of these events is typed on a card. The patient is to sort them into two piles: experienced, not experienced.

Stress Scale Events

Having strangers sleep in the same room with you.
Having to sleep in a strange bed.
Having strange machines around.
Being awakened in the night by the nurse.
Being aware of unusual smells around you.
Being in a room that is too cold or too hot.
Having to eat cold or tasteless food.
Being cared for by an unfamiliar doctor.
Having to eat at different times than you usually do.
Having to wear a hospital gown.
Having to be assisted with bathing.
Not being able to get newspapers, radio or TV when you want them.
Having a roommate who has too many visitors.
Having to stay in bed or the same room all day.
Having to be assisted with a bedpan.
Not having your call light answered.
Being fed through tubes.
Thinking you may lose your sight.
Worrying about your spouse being away from you.
Missing your spouse.
Thinking about losing income because of your illness.
Not having enough insurance to pay for your hospitalization.
Having a roommate who is seriously ill or cannot talk with you.
Having a roommate who is unfriendly.
Not having friends visit you.
Not being able to call family or firends on the phone.
Having the staff be in too much of a hurry.
Thinking you might lose your hearing.
Thinking you might have pain because of surgery or test procedures.
Not knowing when to expect things will be done to you.
Having nurses or doctors talk too fast or use words you can't understand.
Not having your questions answered by the staff.
Not knowing the results or reasons for your treatments.
Not knowing for sure what illnesses you have.
Not being told what your diagnosis is.
Thinking your appearance might be changed after your hospitalization.
Being put in the hospital because of an accident.
Knowing you have to have an operation.
Having a sudden hospitalization you weren't planning to have.
Knowing you have a serious illness.
Thinking you might lose a kidney or some other organ.
Thinking you might have cancer.
Being in the hospital during holidays or special family occasions.
Not having family visit you.
Being hospitalized faraway from home.

Having medications cause you discomfort.
Feeling you are getting dependent on medications.
Not getting relief from pain medications
Not getting pain medication when you need it.

Hospital Stress Factors

	Factor	Stress Scale Events	Assigned Rank	Mean Rank Score
1.	Unfamiliarity of surroundings	Having strangers sleep in the same room with you	01	13.9
		Having to sleep in a strange bed	03	15.9
		Having strange machines around	06	16.8
		Being awakened in the night by the nurse	08	16.9
		Being aware of unusual smells around you	11	19.4
		Being in a room that is too cold or too hot	16	21.7
		Having to eat cold or tasteless food	21	23.2
		Being cared for by an unfamiliar doctor	23	23.4
2.	Loss of independence	Having to eat at different times than you usually do	02	15.4
		Having to wear a hospital gown	04	16.0
		Having to be assisted with bathing	07	17.0
		Not being able to get newspapers, radio or TV when you want them	08	17.7
		Having a roommate who has too many visitors	09	18.1
		Having to stay in bed or the same room all day	10	19.1
		Having to be assisted with a bedpan	13	21.5
		Not having your call light answered	35	27.3
		Being fed through tubes	39	29.2
		Thinking you may lose your sight	49	40.6
3.	Separation from spouse	Worrying about your spouse being away from you	20	22.7
		Missing your spouse	38	28.4
4.	Financial problems	Thinking about losing income because of your illness	27	25.9
		Not having enough insurance to pay for your hospitalization	36	27.4
5.	Isolation from other people	Having a roommate who is seriously ill or cannot talk with you	12	21.2
		Having a roommate who is unfriendly	14	21.6
		Not having friends visit you	15	21.7
		Not being able to call family or friends on the phone	22	23.3
		Having the staff be in too much of a hurry	26	24.5
		Thinking you might lose your hearing	45	34.5

Hospital Stress Factors (continued)

	Factor	Stress Scale Events	Assigned Rank	Mean Rank Score
6.	Lack of information	Thinking you might have pain because of surgery or test procedures	19	22.4
		Not knowing when to expect things will be done to you	25	24.2
		Having nurses or doctors talk too fast or use words you can't understand	29	26.4
		Not having your questions answered by the staff	37	27.6
		Not knowing the results or reasons for your treatments	41	31.9
		Not knowing for sure what illnesses you have	43	34.0
		Not being told what your diagnosis is	44	34.1
7.	Threat of severe illness	Thinking your appearance might be changed after your hospitalization	17	22.1
		Being put in the hospital because of an accident	24	26.9
		Knowing you have to have an operation	32	26.9
		Having a sudden hospitalization you weren't planning to have	34	27.2
		Knowing you have a serious illness	46	34.6
		Thinking you mightlose a kidney or some other organ	47	35.6
		Thinking you might have cancer	48	39.2
8.	Separation from family	Being in the hospital during holidays or special family occasions	18	22.3
		Not having family visit you	31	26.5
		Being hospitalized faraway from home	33	27.1
9.	Problems with Medications	Having medications cause you discomfort	28	26.0
		Feeling you are getting dependent on medications	30	26.4
		Not getting relief from pain medications	40	31.2
		Not getting pain medication when you need it	42	32.4

Recovery Inventory

Please circle a number from 1 to 5 to indicate how you rate your physical condition.

1.	Sleep	1 Sleep very poorly	2	3	4	5 Sleep very well
2.	Appetite	1 Poor	2	3	4	5 Excellent
3.	Strength and energy	1 Poor	2	3	4	5 Excellent
4.	Stomach condition	1 Poor	2	3	4	5 Excellent
5.	Bowel condition	1 Poor	2	3	4	5 Excellent
6.	Urination	1 Poor	2	3	4	5 Excellent
7.	Self-Assistance	1 Poor	2	3	4	5 Excellent
8.	Movement	1 Poor	2	3	4	5 Excellent
9.	Interest in your surroundings	1 Poor	2	3	4	5 Excellent

Pain Behavior Rating Scale

Instructions: Rate each category present (yes) or not present (no).

Descriptors:

1. Moaning: a low sustained, mournful sound, usually associated with a painful expression.

2. Gasping: to draw in the breath sharply, as from shock, but associated with pain.

3. Walking in guarded or protected manner: holding a body part, bending slightly while walking, or walking very slowly and carefully.

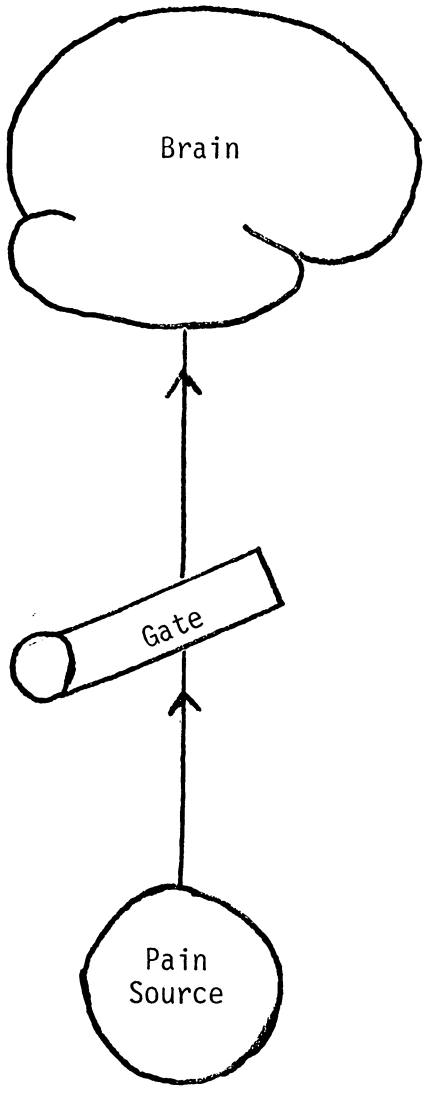
4. Verbalizing the present of pain: Using words to express pain, such as, "my stomach hurst," or "I have a stabbing pain in my chest."

5. A gesture or facial expression: A motion of the limbs or body, such as clutching the bed rails, clenching the fist; or movement of the face that denotes pain, such as a furrowed brow, biting lip, or clenching the teeth.

6. Interruption of activity: Stopping whatever one is doing; i.e., stops walking or talking; and, may be associated with other indices such as verbalizing pain or gasping.

7. Refusing to ambulate: patient refuses to get out of bed or chair because he does not feel well or is experiencing a particular type of pain.

This behavioral rating should be taken twice each day, once at 9:00 A.M. and again at 9:30 P.M. Each rating should be based on at least 5 minutes of interaction with the patient, unless the patient is asleep. The interview with the nurse's aide should occur after seeing the patient.



Factors That Close The Gate*

1. Physical Factors
   A. Medication
   B. Counterstimulation (heat, massage, transcutaneous neural stimulation, acupunture
   C. Appropriate activity level

2. Relative Emotional Stability
   A. Relaxation
   B. Positive emotions (e.g., happiness, optimism)
   C. Rest and isolation

3. Mental Factors
   A. Life involvement and increased interest in life activities
   B. Intense concentration (distraction)
   C. Adaptive Attitudes

Factors That Open The Gate

1. Physical Factors
   A. Extent of the injury
   B. Readiness of the nervous system to send pain signals
   C. Inappropriate activity level

2. Emotional Stress
   A. Depression
   B. Anxiety
   C. Worry
   D. Tension
   E. Anger

3. Mental Factors
   A. Focusing on the pain
   B. Boredom due to minimal involvement in life activities
   C. Nonadaptive attitudes

The Pain Gate

*(Adapted from Karol, Doerfler, Parker, and Armentrout, 1981)

Training Manual Instructions*

The experimenter instructed the patient as follows:

Please read this booklet. It will give you a clearer idea of what we will be doing when I come back. At the end you will find the suggestion that you write down some ideas about a scene that is pleasant and relaxing for you. After you finish reading the booklet, go ahead and begin to do that if you can.

It is possible to use a scene that is already prepared, but other research indicates that personal scenes are the most effective and most people prefer to visualize their own favorite daydream!

*Adapted from Bosmajian (1981).

One method for reducing the stress and pain associated with surgery is to relax by taking time out from the experience by means of an active fantasy--a daydream. The basic process is one of redirecting your attention. You can learn to ignore the stress and pain associated with surgery by engaging in a fantasy which, if it were real, would be the opposite of stress or pain. This daydream is called a Calm Scene. As you learn to direct your attention away from lying in your hospital bed and toward a pleasant picture, your pain tolerance will be increased.

In order for the Calm Scene to be effective in reducing stress and pain, it is important to develop the fantasy in advance and to practice using it before you need it "for real." As with other skills, you will become better at visualizing and relaxing with regular practice. It is important in developing a Calm Scene to select one that is already pleasant and relaxing to you. Memories of a special vacation of images from your favorite season of the year are possibilities. But the Calm Scene can also be your fondest wish-come-true. It does not have to be real. It is also important to make the fantasy as detailed and elaborate as possible. Two examples of Calm Scenes follows:

On a Tropical Island

Imagine yourself basking in the sun of a beautiful tropical island. You can feel the heat of the sun on every inch of your body. There is a slight breeze rustling the palm trees. In the distance you hear the dim sound of an airplane. Above you the sky is a deep blue and far above the island several white birds contrast against the sky. You can hear the

waves breaking on the beach in a gentle rhythm; they almost lull you to sleep. Beneath you the sand is warm. You feel calm, happy, and very relaxed. You don't have a care in the world.

A Summer Fantasy

Now close your eyes, sit back, and relax. Eyes closed, sitting back in the chair, relaxing. Now visualize yourself standing by the shores of a large lake, looking out across an expanse of blue water and beyond to the far shore. Immediately in front of you stretches a small beach, and behind you a grassy meadow. The sun is bright and warm. The air is fresh and clean. It's a gorgeous summer day. The sky is pale blue with great billowy clouds drifting by. The wind is blowing gently, just enough to make the trees sway and make gentle ripples in the grass. It's a perfect day. And you have it entirely to yourself, with nothing to do, nowhere to go. You take from your car a blanket, towel, and swimsuit, and walk off through the meadow. You find a spot, spresd the blanket and lie down on it. It's so warm and quiet. It's such a treat to have the day to yourself to just relax and take it easy. Keep your eyes closed, thinking about the warm, beautiful day. You're in your suit now, walking toward the water, feeling the soft, lush grass under your feet. You reach the beach and start across it. Now you can feel the warm sand underfoot. Very warm and very nice. Now visualize yourself walking out into the water up to your ankles; out farther, up to your knees. The water's so warm it's almost like a bath. Now you're moving faster out into the lake, up to your waist, up to your chest. The water's so warm, so comfortable. You take a deep breath and glide a few feet forward down into the water. You surface and feel the water run down your back. You look around;

you're still all alone. You still have this lovely spot to yourself. Far across the lake you can see a sailboat, tiny in the distance. It's so far away you can just make out the white sail jutting up from the blue water. You take another breath and kick off this time toward the shore swimming with long easy strokes. Kicking with your feet, pulling through with your arms and hands. You swim so far that when you stop and stand the water's only up to your waist, and you begin walking toward the beach, across the warm sand to the grass. Now you're feeling again the grass beneath your feet. Deep, soft, lush. You reach your blanket and pick up the towel, and begin to dry yourself. You dry your hair, your face, your neck. You stretch the towel across your shoulders, dry your back, your legs. You can feel the warm sun on your skin. It must be ninety degrees, but it's clear and dry. The heat isn't oppressive; it's just nice and warm and comfortable. You lie down on the blanket and feel the deep, soft grass under your head. You're looking up at the sky, seeing those great billowy clouds floating by, far, far above (Horan, 1976, p. 316).

Guidelines for Selecting a Calm Scene (Cheek, 1974)

Now try to imagine in your mind a calm scene in as much detail as the ones described above. When you have your calm scene clearly in mind, we will ask you to describe your scene in detail. If you have any problems visualizing a calm scene, we will discuss it with you and try to help you imagine a scene which will help you "get away" for a few minutes.

In selecting a calm scene, try to select one that meets the following guidelines. If a scene you like meets most but not all of the guidelines it may still be a good one.

1. Specific scene. The scene should be a specific place--not just something vague like "in the woods" or "fishing." Think of each scene as a "snap-shot."

2. All scenes. To make your imagined scene clearer, try to use all of your senses. While you imagine your calm scene, what do you see, what do you hear, what do you smell, what do you feel? Notice how the examples given above brings in all the senses.

3. No other persons. The scene should not include any people you know--family members, friends, or co-workers. The reason for this is that there may be times when imagining these people will produce tensions or other thoughts that disrupt the calm scene. For example, it would be all right to imagine yourself on a boardwalk with groups of people in the distance.

4. No active movement or excitement. It is all right to imagine yourself moving slowly and calmly, but avoid vigorous, active movement or excitement.

5. Something you can experience yourself. The calm scene should be something you have actually experienced, or could experience.

6. Keep the same scene. After you settle on a particular calm scene, stay with it. It is important to have one scene that you keep using so that scene can become a trigger to produce in you a completely relaxed state. If you can't decide immediately, try one scene, such as being at the beach, then change the later if you still wish to do so.

When you have chosen a scene, write it below. Concentrate on as many details as possible (adapted from Bosmajian, 1981).

Training Session

The training session proceeded as follows: If the patient had read the training manual and started working on a scene, then using that scene as a basis, the training began. If the manual had not been read and/or the scene development had not been started, those steps had to be completed. If the manual had not been read, the experimenter paraphrased the dydactic content, read and discussed the shorter scene.

Scene development began by asking the patient what he liked to do to relax. Building on that conversation, a basic scene was begun. The experimenter then said:

What we are going to do now is practice your getting a clear, vivid picture in your mind of _____. I'll begin by asking you to focus your thoughts on the scene with your eyes closed for 20 seconds. Then I will ask you to describe what you "saw." After that, we will add some more details to make the picture even more clear. When the scene is complete, we will practice four more times increasing the length of each "trial run" up to five (5) minutes. This time will be for just 20 seconds.

Ready?

Please close your eyes, take a deep breath. Let it out slowly.

Good.

Now imagine yourself _____. Picture it as carefully as you can. See as many details as you can.

After 20 seconds, the experimenter said:

"Stop now please. Describe the scene you were picturing in your mind. I'm going to write down what you say."

The experimenter took notes on what was repeated. If the patient had written ideas, they were used in the creation of the total scene. If the patient had a scene well formulated in his mind as was frequently the case, the 20 second visualization period was unnecessary and was omitted.

The experimenter then said:

"Now I am going to read back to you what you have said. Let's try to add a few more details about what you saw/or would see and how your body would feel and respond if you were really _____."

The experimenter read the notes pausing to elicit sensory and bodily responses or to make suggestions where it seemed appropriate. An effort was made to include three sensory and three response details in the scene.

The experimenter then said:

"Good. Now I am going to read your scene as I have written it down. See if this sounds right to you."

The experimenter read the scene, pausing occasionally to allow patient input. When the scene was developed to the satisfaction of the patient and the experimenter, the experimenter left the room to write the scene in a smooth style. Upon her return, the experimenter said:

"Now let's practice it. Listen while I read your scene. Try to picture it clearly in your mind while I read. Hold that clear, vivid scene in your mind until I say stop. I'll stop you at the end of one (1) minute.

All right.

Close your eyes. Take a deep breath. Let it out slowly.

The experimenter read the scene and waited for one (1) minute.

"Please stop."

Was that picture clear? Please use this scale to rate how well you could visualize the scene."

The experimenter showed the patient an index card with the visualization rating printed on it. The patient responded orally and the response was recorded on the training session data sheet (see Appendix ____).

"All right, let's try again for one (1) minute. Focus your attention on the scene. Close your eyes. Take a deep breath. Let it out slowly."

The experimenter read the scene and waited for one (1) minute.

"Stop please. How clear was your visualization of the scene."

Again, the experimenter presented the rating scale card and recorded the patient's response.

"Fine. Now let's try something a little different. This time, when I read your scene, I want you to picture it as clearly as you can for three (3) minutes. If the scene begins to fade, think back to the beginning and start over. If that doesn't work, if you can't concentrate enough, raise your finger or hand (Experimenter demonstrated both) and I will read the scene again. I will read it as many times as you need for me to do so."

Ok? Now close your eyes. Take a deep breath. Let it out slowly."

The experimenter read the scene and waited for three (3) minutes. If the patient gave the signal, the scene was repeated. At the end of three (3) minutes, the experimenter said:

"Stop please. How clearly were you able to visualize the scene?

The experimenter again presented the rating card and recorded the response.

The experimenter inquired if it seemed appropriate.

"Did you have any trouble?

If problems had arisen in the patient's ability to focus his attention, these were briefly discussed. Occasionally a patient would add to the scene or take a part out. These adjustments were made and the collaborative nature of the process was fostered.

The experimenter continued:

"Now let's try to visualize the scene for five (5) minutes. Remember if the scene fades or you become distracted, start yourself over. If you want to hear it read again, raise your finger or hand."

"Please close your eyes. Take a deep breath. Let it out slowly."

The experimenter read the scene and waited for five (5) minutes. If requested, the scene was repeated. At the end of the five (5) minute segment ratings were taken for visualization and using the same rating format for relaxation and pain as well.

Training Ratings

Visualization Rating

1 minute	1	2	3	4	5
1 minute	1	2	3	4	5
3 minutes	1	2	3	4	5
5 minutes	1 Poor	2	3	4	5 Excellent

Relaxation Rating

Pre	1	2	3	4	5
Post	1 Very relaxed	2	3	4	5 Not at all relaxed

Pain Rating

Pre	1	2	3	4	5
Post	1 Mild	2	3	4	5 Excruciating

Please practice visualizing your calm scene whenever you feel anxious or are in pain. Regardless of how you feel, you should practice at least 3 times a day.

Date	Time	Reason For Using Scene	Length of Practice Time	Date	Time	Reason For Using Scene	Length Practice Time

Visualization Rating					Visualization Rating				
1 Poor	2	3	4	5 Excellent	1 Poor	2	3	4	5 Excellent

Date	Time	Reason For Using Scene	Length of Practice Time	Date	Time	Reason For Using Scene	Length Practice Time

Visualization Rating					Visualization Rating				
1 Poor	2	3	4	5 Excellent	1 Poor	2	3	4	5 Excellent

Please circle a number from 1 to 5 to indicate how useful the Pleasant Scene was in:

1. helping you control your pain.

1	2	3	4	5
not at all				very helpful

2. helping you relax.

1	2	3	4	5
not at all				very helpful

Please circle a number from 1 to 5 to indicate how useful you think your husband's use of the Pleasant Scene was in:

1. helping him control his pain.

1	2	3	4	5
not				very
at all				useful

2. helping him relax.

1	2	3	4	5
not				very
at all				useful

Calm Scene for Mr. W

It is October the 17th. Hunting season at last! You are walking through the dark, quiet woods. The only sound is the swish and crunch of the leaves under your feet as you walk. You shine your flashlight toward the tree tops. The colors come alive in the light--green--orange--a blaze of red--and finally--the yellow leaves of a hickory tree. You stop and look around for a comfortable place to hide. There is a big dead log behind a huge tree. You clear out a patch and settle down by that log. You lean back--and pull out a cigarette. The match flares briefly as you light up. You inhale deeply--and exhale the smoke slowly. The cold air mixed with cigarette smoke tastes good--cold and crisp--you feel your head clear in the cold, dark, quiet woods. It feels good to be alone and quiet. Your muscles begin to relax--they feel limp. It feels good to relax. Your body feels heavier--you breath slowly--in--and out--in--and out. The air is cold, but you feel warm and comfortable--calmer and calmer. Your eyes begin to feel heavy--heavier--and heavier. Your whole body feels warm and heavy--slowly your eyes close--and you slip away--calm and relaxed.

Calm Scene Recall by Mrs. W

It's about hunting season and it's October 17th and hunting season has begun and he is out hunting in the woods; he is supposed to be, anyway. It is dark when he first goes out and he has a flashlight with him and he thinks it is nice to be out there where it is cool and dark and he waits for the light to come up so he can shoot him a squirrel, I suppose. He takes his flashlight and he shines it all around and looks at the different colors that comes alive in the light, the orange and the blades of red and he is mainly looking for the yellow leaf tree which is a hickory tree and so he then finds him a quiet place after he finds the tree in a nice, brush area to sit down and he is going to sit down calmly and smoke him a cigarette and just relax and wait on a squirrel. Then he relaxes into a part where he is smoking that cigarette, breathing in and out and his body begins to get heavier and heavier and his mind clears out and he just feels very peaceful and calm in this scene and at the end he goes to sleep and misses the squirrel.

Calm Scene for Mr. X

Close your eyes and take a deep breath--exhale slowly--imagine it is November it's deer season--5:00 A.M.

You are walking through the woods--slowly--carefully because it is pitch dark. There are no stars--only occasional glimpses of the bright, white moon between the pine branches. The early morning air is cold--and mountain fresh. It smells like frosty pine.

You have been walking for miles through the dark. You pause--this looks like a good place. You brush the dead leaves away from the base of a tree so their crackling noise won't betray your presence. You settle down--arrange your coat--and lean back. After walking so far it feels good to rest--you cradle your gun in your left arm--your right finger rests lightly on the trigger.

Your breathing slows down as you begin to relax. It is so quiet here--far away a turkey calls--then silence. It is good to be here--no worries even your pain fades away--you feel free.

Your muscles feel loose--but your mind is alert as your eyes scan the woods. Now the sun is barely up--its light looks blue and white through the fog. You lightly finger your trigger. Everything is ready--you watch and listen.

Suddenly there is a rustle in the bush and a ten point buck appears. He moves delicately into the clearing--into the pale foggy light. You slowly take aim--you can feel a lump in your throat. Your heart beats faster.

Slowly you pull the trigger--the deer falls.

Calm Scene Recall by Mrs. X

It is November and it is 5:00 in the morning and you are walking for a long, long ways. The air is crisp and cool. The sun is dark. You go to, you get to a tree, throw the leaves away and sit down. The sun is coming through, just beginning to peak through the clouds and the trees. The air is real crisp and cool. It smells like pines. You hear something moving around and it is a turkey. And then quiet and then you look and there is a ten point buck standing there. You aim, pull the trigger, and the deer falls.

Calm Scene for Mr. Y

It is vacation time at last--no fires--no trains.

We are at Myrtle Beach. It is a beautiful July day--hot and clear. There are only a few puppy white clouds floating in the deep blue sky. We are standing on the edge of the beach. As far as you can see, there are no other people--only sand and sky and water. We walk slowly toward the blue ocean. We can hear the surf pounding the shore--see the waves swell in the distance and move toward the shore until they curl and break into white foam. The sand feels soft and hot under our feet as we walk. We stop and gaze at this beautiful blue and white world. Far away--the white gulls soar against the blue sky--a sail dots the horizon. The sun burns hot on our skin. We slowly stretch out on the soft hot sand. It feels soft and hot beneath our bodies. We are content--this is the best place in the world. You can feel all of your tension slipping away. Your muscles relax. You inhale deeply--you feel your lungs expand--fill your chest--and exhale slowly. And again--in--and--out. You feel even more relaxed--your muscles feel limp. You feel heavier and--heavier. The sun beats down--you feel warmer and--warmer.

You are completely calm--content--and totally relaxed.

Calm Scene Recall by Mrs Y

It is vacation time, no fire whistles, no trains. We are at Myrtle Beach. We walk out on the beach. We lay down on the hot sand. It feels so relaxing on your skin and on your bones. It just warms you all over. You are breathing better. Your arthritis seems to almost disappear because the sun is beating down on you. It is real hot but there is still a little cool breeze blowing every now and then. We look at the sea gulls, look at the waves, the foam on the waves--how they come in--is so relaxing. There is a sailboat that dots out in the ocean every now and then. You are so relaxed. Breath in and relax, breath out and you are even more relaxed. Isn't this so pleasant? No worries, no phone calls, not worrying about anything. We just wish we could lay here for about three weeks and that is what we are going to do next summer. We are going to come back and we are going to spend three weeks. We love the beach so much. Look at the sea gulls, honey. Aren't they beautiful how they soar in the sky. Look at them. They are coming down on the beach. They are trying to find some food. Watch them take off at their beautiful wings flapping. Oh, there is another sailboat. Would you like to be on it? No, you would rather just lay in the sand, wouldn't you? Put that suntan oil all over you and lay down in the sand. It is so hot and you are so relaxed. Why this sure beats anything doesn't it? Still, you don't have to worry about going to fires. You don't have to worry about the railroad calling. You can just lay there all day. I'll go into the room and get a Coke and bring it out and that will refresh you. You just relax. Just relax.

Calm Scene for Mr. Z

Close your eyes and take a deep breath--Let it out slowly--Imagine it is late October and you are in New York. You are walking down the side of a mountain. The dry leaves crunch under your feet as you pick your way between the trees. You know where you are going and what you will see at the edge of the woods. You feel a familar thrill as you step out of the gloom into the sunshine. As far as you can see, there is a beautiful, wide valley. You sit down--and lean against a tree. You look and look--your eyes sweep from one end of the valley to the other. The colors are beautiful. The leaves are red and green and light brown. There is a smooth running river flowing down the middle of the valley. Colorful trees line both banks. On the left you can see a lake--it looks blue--a reflection of the dark blue sky. The blue of the lake draws your attention to the sky. Here and there billowy, white clouds float overhead. Your eyes drop down to the wooded ridge far on the other side of the valley--a jagged line against the blue sky. You look down the ridge. You can see where the woodland meets the green pasture. Your eyes wander over the valley. You can see the swampland between the lake and the river. It is thick with tall green ferns--small ponds dot the swamp like puddles after a rain-storm. The rest of the valley is green pastureland criss-crossed by zig-zag rail fences. The green is set off in sections like a huge quilt. Maple trees line some of the fences--adding to the color with their red and green leaves and the spread of brown leaves under them.

You notice the country roads--like long, brown ribbons on each side of the river--it is very quiet here--only the snap of a twig in

your hand--and the chatter of the chipmunks--a bird sings in the distance.

You breath deeply--long, slow, even breaths. The clean, crisp air fills your lungs--it smells fresh--like fall. You feel happy--your mind is at peace--no anxiety--no thoughts of business--just the peace of this valley. You can feel your muscles getting limp--and heavy. Your heart beats slowly--but strong and steady.

You gaze at the valley--you feel like you are seeing a picture--a clear and perfect picture--you want to hold on to this perfect, calm moment.

Calm Scene Recall by Mrs. Z

Late October and it is New York and it is fall time and the leaves were coming out over a mountain looking down into the valley, seeing crisscross, zigzag fence, looking over a lake with marshland, a river. The sky was blue and there was a lake and the forest. It is a peaceful setting.

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THE EFFECT OF THERAPIST AND SPOUSE ASSISTED EMOTIVE IMAGERY ON POST-SURGERY PAIN AND ADJUSTMENT

by

Judith Burnside Peoples

(ABSTRACT)

The psychological well-being of surgical patients is important to the smoothness of recovery. Effective psychological preparation which reduces pre- and post-surgical anxiety should reduce the patient's perception of pain and reduce the stress associated with hospitalization. Within the context of total patient care, there is also concern for the effect the spouse has on the patient. Techniques to improve the care of patients must be both appropriate and feasible given the shortage of staff in hospitals. This reality underscores the need to involve the patient and spouse as active participants in the health care system.

The efficacy of teaching surgical patients a cognitive coping strategy designed to distance the patient from the stressful situation was examined in this study. It was hypothesized that regular utilization of self-generated emotive imagery should decrease the patients' state of anxiety and attenuate the pain experience. The second hypothesis examined whether actively involving the patient's spouse in the emotive imagery treatment would enhance the effects of the coping strategy.

Twenty-four married, male patients who were scheduled for their first laminectomy were contacted the afternoon prior to surgery. They

were divided into three groups (attention-placebo, therapist-assisted intervention, and spouse-assisted intervention) of eight which were matched for type of surgery, surgeon, and duration of back pain. Two treatment sessions were conducted; the first, pre-surgically, was done under the direction of the experimenter; the second, post-surgically, under the direction of either experimenter or spouse.

Using state anxiety, self-report pain measures, behavioral pain measures, and several medication indices as dependent measures, analyses of variance comparing the three groups were performed. No significant main effects or interactions that supported the use of emotive imagery as a presurgical intervention on the utilization of the spouse as a partner in the intervention were found. Reasons for this outcome were explored and suggestions for further research were made. A model for clinical intervention was also suggested.