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BEHAVIORAL INTERVENTION FOR CANCER TREATMENT SIDE EFFECTS

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This discussion reviews the current status of behavioral intervention with adult and pediatric cancer patients. It begins by describing the recent entry of behavioral research and practice into comprehensive cancer treatment. The discussion then examines the use of behavioral procedures to control aversive side effects of treatment. Although the control of chemotherapy side effects is the primary focus (most of the behavioral research on symptom control has dealt with reduction of nausea and vomiting with chemotherapy), the application of behavioral principles to other side effects (i.e., anxiety and pain) associated with the aggressive treatment of cancer is assessed. The third topic is behavioral intervention to control child distress during invasive procedures. The discussion ends with a consideration of new directions of research and practice.

It is now slightly over ten years since the first reports appeared on the use of behavioral intervention procedures with cancer patients (1). That early work was clinical in focus and included a series of individual analyses of various clinical problems (refusal to eat (2), excessive crying (3), and somatic symptoms under social stimulus control (4)). The response of both medical and university audiences to this approach has been extremely positive. Although initially there were clinicians who expressed concern that the application of behavioral principles with very sick and terminally ill patients was inhumane and ignored existential and spiritual issues, today objections are rare and many hospitals and clinics routinely offer behavioral intervention to their patients. Indeed, results from research on behavioral intervention with cancer patients clearly indicate that behavioral procedures are cost effective, have no negative side effects and are accepted by most patients. Moreover, the cancer treatment setting usually provides a good opportunity to carry out clinically meaninfgul and methodologically rigorous individual analyses of important phenomena.

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Behavioral analysis with the cancer patient

Behavioral intervention in cancer therapy is founded in behavioral research and theory. As in other applications of behavioral psychology, its groundwork is the study of human learning and the clinical application of behavioral theory to psychological disorders and education. 'Behavioral oncology', as some have called this area of research and clinical intervention, has a relatively short history (since the early 1980s) as compared to behavioral medicine applied to other disorders, such as heart disease (5), gastrointestinal disorders (6), and diabetes (7).

As in applied behavioral analysis, the therapist is a teacher or coach, providing the patient with specific skills. Although psychologists have been the primary champions of behavioral intervention in oncology, the techniques have been effectively used by nurses, physicians, social workers and other health care professions. As the discussion below will show, behavioral intervention has been used to treat a variety of problems including pain, anxiety, insomnia and treatment noncompliance, to name three problems. However, by far the best known application of behavioral medicine in oncology has been in the control of nausea and vomiting associated with chemotherapy (1, 8, 9).

It is important to point out that behavioral intervention is not meant to replace more traditional psychotherapeutic

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approaches; rather, it is seen as an adjunct. The therapist or counsellor often integrates behavior techniques with supportive psychotherapy as the problem dictates. Moreover, when the behavior therapist has completed the behavioral intervention for which the initial request was made, patients often ask that treatment be continued so that other issues can be addressed. Some writers have suggested that the behavioral intervention often provides the patient the opportunity to develop a trusting relationship with the therapist and becomes the basis of subsequent counseling (10). It is probably important to the wide acceptance of behavioral medicine in oncology that those working in the area hold (and clearly express) the notion that behavioral intervention is not the entire answer to psychosocial support of the cancer patient. Indeed, the attitude of behavioral researchers has been modest.

Reduction of aversive treatment side effects

Nausea and vomiting. There is probably no other advance in behavioral medicine research that has generated as much interest among those treating cancer patients as the introduction of behavioral intervention to control the classically conditioned nausea and vomiting that some patients experience in anticipation of chemotherapy (anticipatory nausea and vomiting, ANV). Despite recent advances in antiemetic drugs, ANV continues to be a clinical problem for as much as 50% of those receiving chemotherapy (11). Indeed, on the strength of the research to date, many health insurance companies will cover the costs of behavioral intervention in the treatment of ANV. The Table summarizes the five methods that have been effectively used to treat ANV. Because of marked similarities across some of these procedures, three categories can be used: relaxation with guided imagery, systematic desensitization, and attentional distraction. These designations are used below to organize the discussion.

Relaxation with guided imagery. A number of relaxation-distraction procedures have been developed to reduce ANV. They are hypnosis, passive relaxation, active relaxation, and EMG biofeedback. These procedures are similar, differing mainly in the way in which relaxation is induced. In passive relaxation, hypnotic-like (i.e., indirect) suggestions of relaxation are used; in active relaxation the patient tenses and releases different muscle groups to induce relaxation. On the other hand, in biofeedback the patient receives feedback regarding muscle tension which he/she used to learn how to become relaxed. In all cases relaxation training is combined with descriptions of quiet scenes. It should be pointed out that the imagery scenes do not focus on the cancer or in any way resemble the 'healing' images that have been used by some therapists. The images are solely intended to distract the patient. The goal of all these techniques is to relax the patient, presumably reducing physiological arousal, and then to block both perceptions of the stimuli which elicit the conditioned nausea, and to block sensations of nausea. To date there are no clinical guidelines to indicate which methods are most effective and how they might be combined. Choice of which one to use appears to be a matter of personal preference. Some argue that passive relaxation is better for very sick patients for whom the tensing and releasing of active relaxation might be difficult. Others argue that active relaxation is easier to learn. Although initial reports on the use of biofeedback were quite positive (12), the procedure is often unreliable and generally not practical because of the equipment that is needed (13).

Systematic desensitization. Another technique used to control the anticipatory side effects of chemotherapy is systematic desensitization. This technique was originally designed to rid people of phobias by systematically desensitizing them to the particular objects or situations which cause them to be anxious. It involves three general steps: the patient is instructed in the use of a relaxation technique, usually progressive muscle relaxation training; the patient and therapist devise a hierarchy of anxiety-provoking stimuli related to the feared situation, ranging from the least to the most frightening; and the patient practices relaxation while systematically visualizing the increasingly aversive scenes.

Table

Behavioral control of anticipatory side effects (nausea and vomiting) of cancer chemotherapy

References	Behavioral method	Outcome
Morrow and Morrell (12)	Progressive relaxation with guided imagery	Reduction in nausea and vomiting
Burish et al. (12)	EMG biofeedback with guided imagery	Reduction in nausea and anxiety
Lyles et al. (21)	Progressive relaxation with guided imagery	Reduction in nausea and anxiety
Morrow and Morrell (9)	Systematic desensitization	Reduction in nausea and vomiting
Redd et al. (22)	Passive relaxation (hypnosis) with with guided imagery	Reduction in nausea; elimination of anticipatory vomiting
Redd et al. (15)	Cognitive and attentional distraction (vis video games)	Reduction in nausea; and anxiety

Attentional distraction. A third strategy, cognitive or attentional distraction, involves blocking the patient's perception of the nausea by active involvement in a task, such as a video game playing (13–15). The strategy is quite simple: engage the patient in an activity that captures his/her attention so that he/she ignores the aversive stimuli. The task can be introduced whenever the patient is likely to experience the symptom or to begin to 'worry' about it. In our research we have found that, for children over the age of nine, video games can successfully block nausea and anxiety, as measured by both self report and behavioral observation. Vasterling et al. (13) observed similar benefits in adult patients who were provided video games in the waiting room. These positive results notwithstanding, it should be noted that video game playing is certainly not the only or necessarily the best method of distraction for all patients. Depending on the patient's own interests/skills, music, reading, and working a puzzle may be more effective. The critical factor is the patient's attentional involvement. If the task holds the patient's full attention than the task should help control nausea. If not, it's unlikely to be effective and the clinician should find another task/activity. It is important to remember that the term attentional distraction implies a functional definition of 'distraction'. Again, if the task does not engage the patient (i.e., if the patient is not 'absorbed' in the activity), then it does not represent attentional distraction and one would not expect it to control symptoms.

Pain and anxiety

Behavioral relaxation and attentional distraction have also been effective in reducing pain and anxiety associated with invasive procedures. There are both experimental and clinical studies of behavioral techniques successfully used with chemotherapy patients to reduce procedural pain and anxiety (16, 17).

Since behavioral symptom control requires active and 'focused' patient involvement, it is generally believed that behavioral intervention is more effective with intense transient pain than with chronic pain. The problem is that patients are generally unable to maintain, for an extended period of time, the active coping procedures that are required for behavioral symptom control. For patients suffering from chronic pain, behavioral techniques are generally used as an adjuvant to pharmacological methods. Such patients are taught various distraction techniques for temporary pain relief and as a sleeping aid. They are also assisted in developing daily activity schedules to prevent increased disability from inactivity.

Controlling fear and distress associated with invasive procedure

Although pharmacological interventions to reduce pain and anxiety in pediatric cancer patients are available, many clinicians try to limit their use because of feared long-term neurological side effects. Increased interest has focused on the use of behavioral methods for reducing distress during invasive procedures. The major effort has been towards developing multifaceted interventions involving: positive reinforcement, behavior blocking with attentional distraction, hypnosis, and multimodal behavior intervention. These applications of behavioral theory represent a major advance in psychosocial oncology as well as a widening of the domain of behavioral medicine.

Positive reinforcement. The most obvious application is recognizing and praising the child's efforts to cope. Behavior therapists (e.g., (16, 17)) have devised various incentive systems in which the child, parent and nurse negotiate a plan that involves the child's earning points for using the intervention skills that he/she had been taught during previous intervention training sessions. It is important to note that the child only has to use the skills to earn the reward; being still or not crying is not required to earn points towards a prize.

Behavior blocking. In conjunction with the attentional distraction techniques described above, various behavior blocking techniques have been used to control child distress during painful medical procedures. The goal is to engage the child in an activity that both distracts his/her attention and physically blocks the actual 'distress' behavior. This two-prong approach attempts to engage the child in a task which is both physically and cognitively incompatible with behavioral distress. In our work at Memorial Sloan-Kettering, we give young children (under 6 years of age) party blowers (a paper whistle-like toy that expands like the trunk of an elephant and makes noise when they blow into it) (16). The idea is to get the child to play with the blower such that crying and resistance are less likely. We have found that this strategy is effective with most young children. In fact, some children request a party blower on their own before all medical procedures and keep one at home. Needless to say, all involved (the child, the parent, the nurse, and the physician) experience the procedure as less stressful when an effective behavior block is used. As was discussed in the review of the use of attentional distraction, the critical factor is the child's interest in and willingness to continue to play during the entire procedure. The particular task is not critical, although we have found the party blower to be especially convenient as it is inexpensive, enjoyed by the child, and can be easily introduced into the treatment setting.

Hypnosis. Although many clinicians are unfamiliar with hypnotic procedures and may have certain prejudices regarding its use, it can be very effective. Moreover, it is very compatible with behavioral methods (18) and some researchers even consider it a behavioral technique. The use of hypnosis to relieve acute pain has a long history yet many clinicians and most laypersons do not understand it and fear it. This is unfortunate since research has demon-

strated the effectiveness of hypnosis with children with cancer (19). Hypnosis involves a relatively simple process in which patients learn to focus their attention on thoughts or images that are unrelated to the source of pain. It is similar to distraction through story telling as is used with young children as well as with adults. Hypnosis appears to rely on many of the same skills required for attentional distraction and one would expect similar results.

Multimodal behavioral intervention. A number of clinical investigators have devised interventions which integrate specific behavioral procedures such as positive reinforcement, distraction and hypnosis (16, 19, 20) to reduce child distress and to increase cooperation and adherence. Such interventions are usually introduced at the beginning of treatment by the nurse or physician who explains the rationale and provides specific training and feedback. An interesting and important part of such multimodal interventions is parent participation. In our research (17) we have found that the parent has a significant impact on the child's behavior. This impact can be positive or negative, depending on the parent's level of anxiety (the greater parental anxiety, the greater child distress) and his/her behavioral rapport with the child (the worse the parent is in matching the child's level of arousal, the greater the child distress). Using a relatively simple parent coaching training program, parents are able to learn how to use behavioral intervention with their child during invasive procedures. When the parent functions as a behavioral coach with the child, both the child and the parent experience less anxiety and show less behavioral distress (e.g., crying and resisting) (16). Indeed, the parent benefits directly by participating as a behavioral coach during stressful medical procedures.

Future directions

The contribution of behavioral researchers to comprehensive cancer treatment over the last ten years has been large and is used in an increasing number of cancer centers. With the burgeoning of interest and research in behavioral medicine in oncology, one can be confident that more advances will be made in the near future. One of the main thrusts of future work may well be the application of behavior theory and research to prevent problems. More and more behavioral researchers are becoming interested in how the administration of cancer treatment might be modified to avoid some of its pernicious behavioral side effects. For example, how can chemotherapy be given so as to reduce the development of aversive side effects, such as food aversions? How can parents be trained so as to be able to prepare their child for protracted therapy? Another advance may well be in the training of front-line medical personnel in behavioral principles so that they might be able to identify behavioral problems and be able to intervene effectively.

Another area of behavioral oncology that is growing is the study of basic behavioral principles in the context of cancer treatment. In this work, cancer treatment and its side effects are used as models of the development of behavioral disorders. The reason is that cancer treatment is carefully controlled and critical behavioral events for patients are programmed and occur at regular intervals. This precision in protocol procedures allows the behavioral researcher to carry out controlled experimental analyses. A related factor is the keen acceptance of a behavioral research strategy (including individual analysis experimental designs) among medical and surgical oncologists. Indeed, they use the same strategy in much of their clinical research.

It is clear that behavioral researchers and clinicians have made a significant contribution to our understanding of patient's responses to cancer treatment and to the design of effective methods for reducing patient distress. The strength of the work that has been conducted leads one to expect important new advances in the future.

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