

# Special Article

## TRANCEFORMATIONS: HYPNOSIS IN BRAIN AND BODY

David Spiegel, M.D.\*

*In this review, the role of hypnosis and related psychotherapeutic techniques are discussed in relation to the anxiety disorders. In particular, anxiety is addressed as a special form of mind/body problem involving reverberating interaction between mental and physical distress. The history of hypnosis as a therapeutic discipline is reviewed, after which neurobiological evidence of the effect of hypnosis on modulation of perception in the brain. Specific brain regions involved in hypnosis are reviewed, notably the dorsal anterior cingulate gyrus and the dorsolateral prefrontal cortex. The importance of hypnotizability as a trait, stable variability in hypnotic responsiveness, is discussed. Analogies between the hypnotic state and dissociative reactions to trauma are presented, and the uses of hypnosis in treating posttraumatic stress disorder, stressful situations, and phobias as well as outcome data are reviewed. Effects of hypnosis on control of somatic processes are discussed, and then effects of psychosocial support involving Supportive–Expressive Group Therapy and hypnosis on survival time for cancer patients are evaluated. The evidence indicates an important role for hypnosis in managing anxiety disorders and anxiety related to medical illness. Depression and Anxiety 30:342–352, 2013. © 2013 Wiley Periodicals, Inc.*

**Key words:** anxiety/anxiety disorders; dissociation; trauma; agoraphobia; PTSD/posttraumatic stress disorder

### HYPNOTIC HISTORY

Hypnosis is the first Western conception of a psychotherapy, the first time a talking interaction between a doctor and a patient was thought to have therapeutic potential.<sup>[1]</sup> Hypnosis has been used as an adjunctive tool in the treatment of traumatic experiences, pain, and anxiety for more than 200 years. Initial uses involved hypnotic analgesia to help patients through traumatic surgical procedures before the advent of inhalation

anesthesia.<sup>[2]</sup> Hypnosis was used to good effect to control pain during surgery, prior to the introduction of chemical anesthesia.<sup>[2]</sup> Freud began his exploration of the unconscious through the use of hypnosis at a time when he thought of hysterical reactions as the aftermath of traumatic experiences in childhood.<sup>[3]</sup> He abandoned its use when a patient exited a trance state and embraced him. Freud, noting that “I was modest enough not to attribute this event to my own irresistible personal attractiveness.” Freud<sup>[4]</sup> decided that hypnosis represented a mobilization of tranceference phenomena, and so gave it up in favor of free association and psychoanalysis, though later in his career he opined that “The pure gold of analysis might have to alloyed with the copper of suggestion.”<sup>[5]</sup> Hypnotic techniques were then used during World War II to treat what were then called “traumatic neuroses.” Despite the growing acceptance of psychoanalysis as the model for psychotherapy in that era, hypnotic techniques were found to be efficient and effective in helping soldiers with acute combat reactions to work through, control, or put aside the effects of traumatic experiences.<sup>[6]</sup> With the recognition of posttraumatic stress disorder (PTSD) as a diagnosis<sup>[7]</sup> has come increased interest in hypnosis as a tool in psychotherapy.

Stanford University School of Medicine, Stanford, California

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\*Correspondence to: David Spiegel, Room C231 401 Quarry Road, Palo Alto, CA 94305-5718. E-mail: dspiegel@stanford.edu  
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## CLINICAL APPLICATIONS OF HYPNOSIS

Hypnosis is a state of highly focused attention, coupled with dissociation of competing thoughts and sensations toward the periphery of awareness, and enhanced response to social cues.<sup>[8]</sup> Hypnosis is analogous in consciousness to what a telephoto lens does to a camera. What you see, you see with great detail, but disconnected from its visual context. In the same way, hypnosis helps you to focus attention and put aside distraction. It is comprised of three components: absorption, dissociation, and suggestibility. Hypnosis has been referred to as “self-altering attention,” the capacity to lose oneself effortlessly in what one is concentrating on. Indeed, people who have more spontaneous experiences of losing themselves in a movie or a sunset are likely on formal testing to be more highly hypnotizable.<sup>[9,10]</sup> This capacity to lose oneself implies dissociating, processing potentially distracting information outside of conscious awareness. The third component is suggestibility. This does not mean that the hypnotized person is unable to exert control over what they think and do, but rather that they are inclined to go along with hypnotic suggestions because they are less likely to consider alternatives and analyze the context of the suggestions: who is this person and why is he/she asking me to do this? We have all had the “it seemed like a good idea at the time” experience. In hypnosis, people focus more on “what” than “why,” so compliance is more likely. This can actually be useful in getting patients to step away from old maladaptive ways of dealing with problems such as anxiety.

### HYPNOTIZABILITY AS A TRAIT

The capacity to exert this top-down processing control involving hypnosis varies considerably among adults. While most children are highly hypnotizable, substantial variation in responsiveness to hypnosis develops in adult life and persists. Hypnotizability becomes a stable trait, with a test-retest correlation of .7 over a 25-year interval, which is greater stability than is found with intelligence over a similar interval.<sup>[11]</sup> Despite this reliability, few meaningful correlates of this trait, either psychological or neurobiological, have been identified, despite many efforts to find them.<sup>[10,12-14]</sup> It has been established that a tendency for self-altering attention, called “absorption,” is moderately but significantly correlated with hypnotizability.<sup>[9,10]</sup> This means that people who have hypnotic capacity tend to use it spontaneously, even without any formal training or exposure to hypnotic techniques.

One especially useful way of introducing hypnosis into the therapy is through the use of a clinical hypnotizability scale, such as the Hypnotic Induction Profile.<sup>[8]</sup> This is a good way to initiate experience with hypnosis in treatment for several reasons:

- (1) It provides useful information about the patient’s degree of hypnotizability, which provides empirical guidance for the choice of treatment. The presence and degree of a patient’s hypnotizability can help in designing treatment with hypnosis. The absence of hypnotic responsiveness, if identified, can lead to a choice of other more effective treatments, ranging from progressive muscle relaxation to medication.
- (2) It enables the clinician to turn the hypnotic induction into a deduction about the patient’s ability to respond. Thus reduces performance pressure on both the patient and the clinician. Such an atmosphere can enhance the treatment alliance and defuse anxieties about loss of control. It also helps to demystify hypnosis.
- (3) All hypnosis is really self-hypnosis. Testing provides a framework for teaching patients how to use their capacity for self-hypnosis as part of their ongoing treatment and symptom management.

## HYPNOTIC MODULATION OF PERCEPTION

Hypnosis is a powerful means of altering pain, anxiety, and various somatic functions, even under highly stressful circumstances such as interventional radiology procedures and surgery for breast cancer.<sup>[15-19]</sup> Hypnotic alteration of perception, best studied in the somatosensory and visual systems, involves a top-down resetting of the intensity of perceptual response itself, rather than just an alteration in postperception processing. This has been through reduction in early (p100) as well as late (p300) components of somatosensory event-related potentials during hypnotic analgesia instructions.<sup>[20]</sup> In addition, the nature of the hypnotic instruction influences the part of the brain involved in producing hypnotic analgesia. If subjects are told that the pain is there but will not bother them, there is reduced activity of dorsal anterior cingulate cortex (dACC), while if they are told they can reduce perception of the pain itself through a competing sensation such as tingling numbness, the analgesia is accomplished through reduced activity in somatosensory cortex.<sup>[21-23]</sup> Several studies have examined the idea that endogenous opiates account for hypnotic analgesia. However, with one partial exception,<sup>[24]</sup> studies with both volunteers<sup>[25]</sup> and patients with chronic pain<sup>[26]</sup> have shown that hypnotic analgesia is not blocked and reversed by a substantial dose of naloxone, an opiate receptor blocker. In contrast, placebo analgesia is mediated by endogenous opiates.<sup>[27]</sup> Therefore, the cortical mechanisms of hypnotic analgesia described above are a more plausible explanation for hypnotic reduction of pain.

With the use of hypnosis, believing is seeing: hypnotic alteration of color vision results in congruent changes in blood flow in the lingual and fusiform gyri.<sup>[28]</sup> An instruction to drain color from a grid like a Mondrian painting results in decreased blood flow in the color-processing regions, whereas hypnotic illusion that

a black and white grid is filled with color results in perception of the color and increased blood flow in those regions. Hypnotic suggestion that words are written in an unknown language can reduce or eliminate the well-known Stroop color–word interference phenomenon, with concomitant reduction in activation of the dACC.<sup>[13,14,29]</sup> The amount of time delay in naming a color–word presented in a different color is mediated by interaction between the dorsolateral prefrontal cortex (DLPFC) and ACC.<sup>[30]</sup> These are examples of how hypnosis can provide a model system for brain control over perception and behavior. Such hypnotic reduction of interference tasks has been shown in some studies to occur especially when the hypnotic state is induced, so the phenomenon is more than a trait difference—it requires entry into the hypnotic state among people capable of it.<sup>[31]</sup>

### BRAIN REGIONS INVOLVED IN HYPNOSIS

The dACC and DLPFC contribute in important ways to both hypnotizability and sensory control. These regions are involved in the executive network of attention including selective attention and conflict resolution.<sup>[32]</sup> The dACC and lateral PFC are also part of the mesocortical dopamine system<sup>[13]</sup> and hypnotizability has been found to be correlated with levels of homovanillic acid, a dopamine metabolite, in the cerebrospinal fluid.<sup>55</sup> High-hypnotizable individuals, in contrast to low hypnotizables, have altered activation of the dACC<sup>[14,21–23,33–38]</sup> and PFC<sup>[13,21,34,35]</sup> when they are modulating pain perception, reducing Stroop interference, and during rest when they are in versus out of hypnotic states.<sup>[39]</sup> These findings suggest that these two brain regions are involved in top-down modulation of perception during hypnosis. We have recent evidence that there are detectable differences in functional connectivity between these regions between high- and low-hypnotizable individuals.<sup>[40]</sup> In a resting-state functional magnetic resonance imaging (fMRI) study, high- compared to low-hypnotizable individuals showed greater functional connectivity between left DLPFC, an executive-control region of the brain, and the salience network, which composed of the dACC, anterior insula, amygdala, and ventral striatum. This region is involved in detecting, integrating, and filtering relevant somatic, autonomic, and emotional information. These functional differences were not due to differences in brain anatomy in these regions. These results are similar to but not identical to observations that there are increases in left frontal activation during mindfulness practice,<sup>[41,42]</sup> Our findings differ in emphasizing co-activation of dACC along with DLPFC. Mindfulness is considered a practice that must be developed with considerable time and effort. Unlike hypnosis, it is not targeted at specific symptoms, but rather is a practice involving developing a sense of open presence, scanning of the body, and compassion. Both, however, involve de-

veloping the ability to shift among mental states, which seems to provide benefit in dealing with stress and anxiety.

### ANXIETY: MIND AND BODY

Anxiety disorders are the most common of psychiatric problems, with a 12-month prevalence of 18.1% and a lifetime prevalence of 28.8%.<sup>[43]</sup> They are also archetypal mind–body problems, since an interaction between psychological and somatic distress is a hallmark feature of all of the disorders: generalized anxiety disorder, panic disorder, agoraphobia, specific phobias, acute stress disorder (ASD), and PTSD. All of these disorders involve a reciprocating cycle of mental and physical distress. This makes techniques such as hypnosis that involve enhanced control by the mind over the body especially salient to treatment.

Most people with anxiety disorders understand that, at some level, their fears are exaggerated or irrational. Yet, oddly enough this is rarely reassuring. The very lack of definition of the source of the discomfort can exaggerate the fear, enhancing the patient’s sense of helplessness and desire for avoidance. And yet the more they avoid the source of the fear, the more they cement an associational network that reinforces the strength of the threat. The challenge is to convert anxiety into fear, to give it a focus, so something can be done about it, in the same sense that converting depression into sadness can help depressed individuals work through the sources of their sadness so that the erosion of their self-worth and feelings of hopelessness and helplessness are reduced. Yet to do this, one has to offer patients tools that enable them to face their fears or sadness without a downward cycle of mental and physical distress. The ability to provide physical comfort in the fact of fear is a potentially valuable therapeutic tool.

From the point of view of therapeutic strategy, anxiety involves pathological distraction of attention from necessary day-to-day functions, and a negative feedback cycle between psychological preoccupation and somatic discomfort, a kind of “snowball effect,” in which subjective anxiety and somatic tension reinforce one another. When someone notices an increase in heart rate, sweating, or tension in their abdomen, they are likely to respond with increased anxiety, reading the somatic signals as an indication of what a tight spot they are in. This can in turn trigger further somatic response, and on it goes. Hypnosis can be especially helpful not only because of its ability to reduce anxiety and induce relaxation,<sup>[44]</sup> but because of the dissociative element of hypnosis which facilitates separation of the psychological and somatic components of anxiety. There is evidence that hypnosis is as effective at reducing anxiety as 1 mg of alprazolam, at least among college student populations.<sup>[45]</sup> Hypnosis has also been found to have as consistent anti-anxiety effects in such populations as does autogenic training and quiet rest.<sup>[46]</sup> It is particularly important to employ the dissociative capacity of the patient, to help

them separate their focal attention, even that devoted to anxiety-related issues, from somatic sensations of discomfort and restlessness.

## STRESS AND TRAUMA

PTSD is, unfortunately, a common disorder, with a 12-month prevalence in the United States of 3.5%, a third of these severe cases.<sup>[47]</sup> There is much that is naturally dissociative in both the immediate and the long-term response to trauma.<sup>[48–51]</sup> There are a substantial number of dissociative features in the symptoms of PTSD, especially flashbacks, numbing, and amnesia. The role of dissociation was most recently recognized in the proposal to include a dissociative subtype of PTSD in the DSM-5.<sup>[52]</sup> This change is based on new evidence that a sizeable subgroup of those with PTSD suffer additional dissociative features, notably depersonalization and derealization.<sup>[53]</sup> A recent major epidemiological study involving 25,018 people from 16 countries in a World Mental Health Survey found that 14.4% of those with PTSD also had the dissociative symptoms of depersonalization and derealization. They were characterized as well by higher levels of re-experiencing symptoms, the onset of PTSD in childhood, higher trauma exposure and childhood adversities, severe role impairment, and suicidality.<sup>[54]</sup> This subgroup can be distinguished as well using fMRI by a pattern of frontal activation and limbic suppression in response to trauma scripts, in contrast to the more common hyperarousal type of PTSD, with hypofrontality and limbic activation.<sup>[55]</sup>

Hypnosis can be understood as a state of artificially induced dissociation,<sup>[8]</sup> and so it is especially relevant and useful in accessing memories of trauma and in helping patients to work them through as part of the treatment of PTSD. Memory is known to be state dependent,<sup>[56]</sup> so being in a comparable mental state during treatment to that experienced during trauma would understandably lead to better recall, and then to more effective working through of trauma-related memories. Exposure-based psychotherapies, which involve a combination of arousal management techniques and controlled revisiting of aspects of the trauma, are among the most effective treatments for PTSD.<sup>[57]</sup>

The fundamental principles of the use of hypnosis in the treatment of PTSD involve (1) inducing controlled access to traumatic memories; (2) helping patients to control the intense affect and strong physiological responses that may accompany memories of trauma, and (3) helping individuals restructure the memories and their meaning. Hypnotic concentration can be utilized to help patients work through and grieve various aspects of the traumatic experience and place their memories into a new perspective, which is a form of cognitive restructuring.

There are two basic means of accessing traumatic memories using hypnosis. One involves hypnotic age regression. Subjects are instructed to go back and relive earlier periods of their life as though they were occur-

ring in the present. They are told that when given a signal, they will experience the event as though it were occurring in the present. Later, when given another signal, their temporal orientation will be changed again. This technique is intense, and only useful among those who are highly hypnotizable—the upper 10–15% of hypnotizability.

An alternative and more commonly utilized method is to have them picture on an imaginary screen a pleasant scene to establish their ability to visualize in this manner and then to picture a scene taken from the traumatic experience as though they were watching it, while maintaining a comfortable feeling of floating relaxation in their body. This instructed dissociation of the psychological from the physical keeps the patient feeling comfortable and safe, and indicates his or her ability to control their somatic responses even while reliving trauma-related memories. It is useful to have them split the imagined screen in half and view the traumatic event on one side of this screen, and on the other side picture the trauma from a different point of view (e.g., focusing on what they did to protect themselves during the trauma). It might have been fighting off an assailant, attempting to help a wounded friend, or simply deciding to remain quiet so as not to provoke an attacker. It is then useful to debrief patients afterward, discussing their memories of the hypnotic work and what new meaning they have extracted from it. This is also an emotional consolidation phase in the therapy, when patients need time to work through and put into perspective strong emotions that might have been aroused by the hypnotic revisiting of the traumatic memories. Patients who are not overwhelmed by the material, who have good general mental health (i.e., are not suicidally depressed or psychotic), or who have supportive resources available can be taught to continue the therapeutic work as a self-hypnosis exercise at home. The instructions can include a repetition of the self-hypnosis induction, then using the screen technique to visualize contrasting aspects of the trauma: acknowledging and bearing their helplessness while recognizing their efforts to cope with and master the traumatic situation. This can be practiced once or twice a day. Such exercises often have the effect of organizing and containing the traumatic memories, confining them to the self-hypnosis exercises, and thereby freeing the patient to deal with other issues the remainder of the time.

## STRESS MANAGEMENT

A variation of this split-screen technique involving hypnosis can be employed for stress management.<sup>[8]</sup> The subject is taught to use self-hypnosis, imagine him or herself in a physically comfortable situation—floating in a bath, a lake, a hot tub, or floating in space—and then picture the stressor on the left side of the screen while maintaining physical comfort. They are then asked to brainstorm a potential solution to the problem on the right side of the screen. This “brainstorming” is

meant to help them take a more active stance toward the problem, and to widen the scope of their potential responses to it.

### TREATMENT OUTCOME

One randomized outcome trial indicates that hypnosis is a useful adjunct to treatment for PTSD,<sup>[58]</sup> and there is accumulating evidence suggesting that hypnosis is highly effective.<sup>[59]</sup> There are also studies showing that hypnotizability is higher among individuals with ASD<sup>[60]</sup> as well as PTSD<sup>[61–63]</sup>. Thus, the research suggests that patients with PTSD, as a group, are extremely hypnotizable. This is consistent with the theory that dissociation is a spontaneous response to trauma and is in turn a component of PTSD symptomatology. Furthermore, it provides systematic data suggesting that, as a group, individuals with PTSD should have extremely high hypnotic capacity and therefore be especially able to effectively incorporate hypnosis into their psychotherapy.<sup>[64]</sup>

## PHOBIAS

Phobias are common problems that often interfere with social and occupational functioning to a pronounced degree. The 12-month prevalence of specific phobia is 8.7%, and the lifetime prevalence is 12.5%.<sup>[65]</sup> Of those with the disorder, 32.4% are receiving treatment for it. There is something hypnotic like about certain specific phobias: subjects become immobilized by a specific irrational premise and lose their usual sense of agency in controlling their fears or their responses to the feared situation. Hypnosis can be used to prepare for and during exposure to the feared situation. For example, people with flying phobia can be taught to concentrate on three concepts: (1) float with the plane; (2) think of the plane as an extension of your body, like a bicycle; (3) think about the difference between a probability and a possibility. This is designed to enhance the patient's sense of control over the situation, seeing their role in choosing the flight, while maintaining a physical sense of comfort, and putting their fears of a crash into perspective. In a large case series ( $N = 174$ ), we found that 52% of phobics taught this self-hypnosis exercise in a single session were either improved or cured.<sup>[66]</sup> Similar approaches can be used for people with animal phobias and other simple phobias. The special advantage of self-hypnosis is that patients can be taught a skill they can practice and utilize in preparation for and during the feared situation. However, compared to its apparent effectiveness, there are relatively few randomized controlled trials of hypnosis in the treatment of anxiety disorders. Perhaps its early history of mysticism coupled with official disfavor has discouraged research. Also, techniques that clearly apply similar principles and mobilize mental state changes, such as the relaxation response<sup>[67]</sup> and Eye Movement Desensitization and Reprocessing (EMDR),<sup>[68]</sup> studiously avoid the obvious comparison.

## MEDICAL, SURGICAL, AND DENTAL PROCEDURES

Because hypnosis can be used to induce a state of physical relaxation and reduce anxiety, it has proved to be valuable as an adjuvant to medical procedures. Once patients have been trained in the use of self-hypnosis, they can use it both in preparation for undergoing medical procedures and during them. They can use self-hypnosis to imagine themselves being somewhere else, a place that they associate with physical comfort, such as floating in a bath, a lake, a hot tub, or just floating in space, thereby dissociating their mental experience from the physical discomfort and contextual anxiety related to the procedure. It can also be used as a means of mastering the anxiety associated with potentially threatening diagnostic procedures,<sup>[69]</sup> such as endoscopies,<sup>[70,71]</sup> colonoscopies,<sup>[72,73]</sup> imaging techniques (i.e., computed tomography and magnetic resonance imaging),<sup>[74–78]</sup> bone marrow aspirations,<sup>[79–81]</sup> needle phobia,<sup>[82–87]</sup> liver biopsy,<sup>[88]</sup> dental procedures,<sup>[89]</sup> and lumbar punctures.<sup>[81,86,90]</sup> Hypnosis is also helpful in helping patients through therapeutic interventions such as chemotherapy<sup>[75,91–103]</sup> Faymonville et al. 1995, external beam radiation therapy,<sup>[104,105]</sup> surgery and its recovery,<sup>[106,107]</sup> and interventional radiology.<sup>[108–110]</sup> A randomized clinical trial involving patients undergoing percutaneous vascular and renal procedures compared training in hypnosis with the presence of a sympathetic nurse for emotional support and routine analgesia. All subjects had access to patient-controlled intravenous analgesia. The subjects in the hypnosis condition used half the pain medication, and experienced significantly less pain and anxiety, fewer procedural complications, and overall procedure time was 17 min shorter. The cost of the procedure was \$348 less per patient in the hypnosis condition. So, hypnosis made their experience less uncomfortable, less anxiety provoking, safer, and shorter.

## HYPNOTIC EFFECTS ON THE BODY

There is evidence that hypnosis can facilitate a surprising amount of control over somatic functions that are not thought likely susceptible to mental management. For example, we examined the ability of hypnosis to both stimulate and inhibit gastric acid secretion among highly hypnotizable healthy volunteers. When subjects were hypnotized and instructed to imagine eating a series of delicious meals, gastric acid output rose from a basal mean of  $3.60 \pm 0.48$  to a mean of  $6.80 \pm 0.02$  mmol with hypnosis, an increase of 89% ( $P = .0007$ ). In a related study, subjects underwent two sessions of gastric analysis in random order, once with no hypnosis and once with a hypnotic instruction to experience deep relaxation while not thinking about food or drink. With hypnosis, there was a 39% reduction in basal acid output ( $4.29 \pm 0.93$  vs.  $2.60 \pm 0.44$  mmol,

$P < .05$ ) and an 11% reduction in peak gastric acid output stimulated by pentagastrin ( $28.69 \pm 2.34$  vs.  $25.43 \pm 2.98$  mmol,  $P < .05$ ). Thus, there was bidirectional control of gastric acid output related to the type of hypnotic instruction. Hypnosis has also been used in the rehabilitation of such problems as pseudoepilepsy,<sup>[111-113]</sup> irritable bowel syndrome,<sup>[18,114-117]</sup> and contractures of the hand.<sup>[118]</sup>

## PSYCHOTHERAPY FOR WOMEN WITH BREAST CANCER

The effect of psychosocial support on cancer progression is a far more complex problem. Since claims have been made that simply visualizing white blood cells killing cancer cells could affect survival time,<sup>[119]</sup> we undertook a series of studies of the effects of intensive psychosocial treatment involving hypnosis and group psychotherapy on both quality of life and survival time of women with metastatic breast cancer.

We developed a 1-year weekly group psychotherapy intervention: Supportive-Expressive Group Psychotherapy (SEGT). The groups are designed to provide social support and encourage emotional expression, and last 1.5 hours. They work on problem clarification, grief work related to having cancer and the effects of the illness, guidance regarding family problems, doctor-patient relationships, and reordering life priorities in the face of terminal illness. Group members are taught self-hypnosis to process major themes discussed in the groups, and for the management of cancer-related anxiety and pain. The groups emphasize building intense mutual support. Group members are encouraged to discuss the ways in which they have acquired expertise in coping with the illness, thereby enabling them able to provide concrete assistance to other patients.<sup>[120-124]</sup> The group provides a new network of support while enhancing existing family and other social ties. Our experience is that even direct confrontation with progressive disease or death among members is not demoralizing to patients when handled appropriately<sup>[125,126]</sup> and that such involvement reduces mood disturbance, PTSD symptoms,<sup>[120]</sup> and pain<sup>[127,128]</sup> among metastatic cancer patients. The groups emphasize accommodation to the illness, accepting restrictions in life activities and plans as necessary, and working through fears of dying and death.<sup>[124,125]</sup> The confrontation with mortality brought on by cancer is treated as an opportunity to review and revise life values and enhance control over one's intrapsychic and interpersonal experience. Patients are taught to use the group to examine important personal relationships and set realistic goals for change. In this way, the threat of limited survival is reconceptualized as a challenge to make the best possible use of available time with family and friends. However, patients are not instructed to expect any direct effect of the intervention on the course of the disease. The intervention protocol has been manualized,<sup>[129,130]</sup> and therapists have been successfully trained and evaluated for their abili-

ties to (1) personalize interactions so that they focus on the "here-and-now"; (2) encourage emotional expression; (3) encourage active coping; and (4) maintain group boundaries.<sup>[131]</sup>

Emotional expression in a supportive, empathic environment is a key component in the reduction of psychological distress in ill patients.<sup>[132-134]</sup> The concept of *social-cognitive processing* synthesizes social support and emotional expressiveness.<sup>[135]</sup> The supportive/expressive model of group support encourages therapists to facilitate open ventilation of fears of dying and death, anxiety about the future, and sadness regarding life losses.<sup>[129]</sup> Even grieving the deaths of other members can be reassuring by helping those who are dying experience the depth of feeling others will have for them when they die. Some also feel fortunate, reappraising their situation as more fortunate than that of someone else in the group who has died of the same illness.<sup>[136-138]</sup> Indeed, emotional suppression and avoidance inhibit active coping and are associated with reduced intimacy among family members. We have shown in a number of randomized clinical trials that such expression of emotion reduces rather than increases distress,<sup>[120,139,140]</sup> even among those with significant depression.<sup>[141]</sup> Our studies have demonstrated that the mechanism of improvement in distress through SEGT is reduced suppression of emotion,<sup>[133]</sup> which mediates the reduction in distress. We conceptualize these psychological changes as involving two interrelated processes: (1) a reduction in emotional reactivity, and (2) improved ability to regulate distressing negative emotion. Moreover, effects of SEGT on emotion regulation appear to be both general across the domain of negative emotion (e.g., related to anxiety and depression symptoms) as well as specifically within the domain of cancer-related negative emotion.

## EFFECTS ON SURVIVAL

Could psychotherapeutic support for cancer patients actually affect the course of cancer? We reported in 1989 (Fig. 1) the results of a clinical trial demonstrating that women with metastatic breast cancer randomized to a year of weekly group therapy lived 18 months longer than control patients, and that the difference was not due to differences in initial disease severity or subsequent chemo- and radiotherapy.<sup>[142]</sup> The result of this 10-year study was first greeted with great excitement and later skepticism. We understand both reactions.

The hope that intensive emotional support could add to both quality and quantity of life would provide additional opportunities for effective treatment of breast cancer in conjunction with advances in surgical, chemotherapeutic, hormonal, monoclonal antibody, and radiotherapeutic interventions. At the same time, the idea that improved coping, facing existential concerns, better emotion management, and enhanced social support could actually affect disease progression would seem on its face unlikely, and could add a burden of guilt to patients already suffering from the cancer and its treatment.

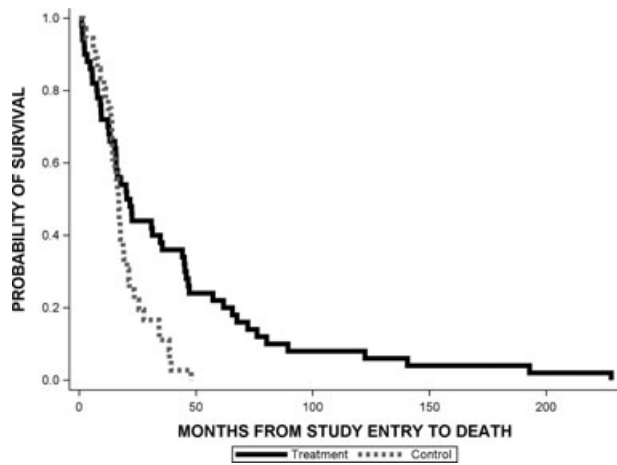


Figure 1. Psychosocial intervention and cancer survival.

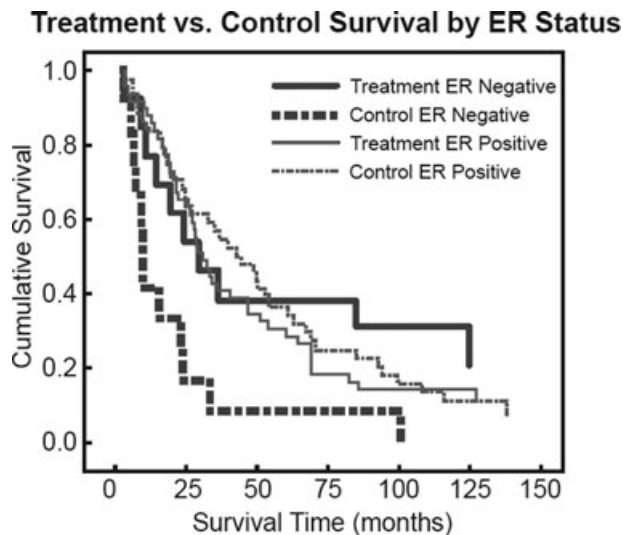


Figure 2. Interaction of ER status with group therapy treatment effect on survival.

In the spirit of further examining the relationship between group psychotherapy and breast cancer survival, we replicated the study a decade later that showed no overall effect of a similar group therapy intervention on breast cancer survival, but a significant interaction with tumor type, such that those with ER negative cancers who were randomized to group therapy lived significantly longer than did ER negative patients receiving standard care alone (Fig. 2).<sup>[143]</sup> This second study failed to confirm the main hypothesis that facing death together could improve survival, and we questioned the original finding. Major advances in hormonal and chemotherapies improved overall survival for women with metastatic breast cancer in the interim,<sup>[144]</sup> but women with ER negative tumors do not benefit from the advancement in treatment outcome associated with antiestrogen treatments.<sup>[144,145]</sup> So, it was possible that the earlier improvement in outcome had been

supplanted by better overall survival, with the exception of ER negative women. This explanation receives some support from other recent studies by independent investigators.<sup>[146]</sup> Overall survival of our cohorts of women with metastatic breast cancer has improved over the decades.

An independent randomized trial of psychoeducational groups for women with primary breast cancer found significantly reduced rates of relapse and longer survival.<sup>[147,148]</sup> In addition to this and our original study,<sup>[142]</sup> a recent randomized clinical trial of palliative care for nonsmall cell lung cancer patients published in the *New England Journal of Medicine* makes that case strongly.<sup>[149]</sup> There was a clear but apparently paradoxical finding: "Despite receiving less aggressive end-of-life care, patients in the palliative care group had significantly longer survival than those in the standard care group (median survival, 11.65 vs. 8.9 months;  $p = .02$ )"<sup>[149]</sup> (p. 738). Those in the palliative care condition became less depressed as well. Three other published randomized trials<sup>[150-154]</sup> and one matched cohort trial<sup>[155]</sup> have found that psychosocial treatment for patients with a variety of cancers produced both psychological and survival benefits. However, seven other published studies, six involving breast cancer patients,<sup>[156-161]</sup> and one with lung and gastrointestinal cancer patients,<sup>[162]</sup> found no survival benefit for those treated with psychotherapy. Three of these six studies showed no emotional benefit of the intervention,<sup>[156,158,163]</sup> making any possible survival advantage unlikely. In a major multicenter trial that reported significant reduction of depression but no effect on survival, the treatment group was more depressed than the control group at baseline,<sup>[159]</sup> which gave them a poorer medical prognosis based on recent research.<sup>[164,165]</sup> Furthermore, the outcome of all of these studies is not random: no studies show that such attention to depression and mortality shortens survival.<sup>[146]</sup> Thus, the literature makes it a plausible research question to examine whether psychosocial support can extend cancer survival time, especially since pathways linking stress reduction to changes in endocrine, immune and autonomic nervous system function, and gene expression to cancer progression are being identified.

## CONCLUSION

Hypnosis is a naturally occurring state of highly focused attention. People vary in their ability to utilize it. It has special relevance to the assessment and treatment of anxiety disorders, including PTSD, because of its sensitizing role in enhancing the potential for mind-body control. The phenomena that constitute hypnosis: absorption, dissociation, and suggestibility, are mobilized spontaneously during trauma, during which they may serve as a unique and adaptive defense against overwhelming fear, pain, and anxiety. Thus, hypnotic phenomena underlie important aspects of the response to

stress and trauma. More is being learned about brain function related to hypnosis. Hypnotic alteration of perception is accompanied by marked changes in the relevant sensory cortices, as well as brain regions involving context monitoring (dorsal anterior cingulate gyrus) and executive function (DLPFC). Hypnosis alters sensation itself, not just response to sensory input, making it a powerful tool in modulating pain as well as anxiety. Self-hypnosis is a useful skill to teach people dealing with phobias and medically related anxiety. More intensive psychotherapeutic techniques involving group therapy and hypnosis improve quality of life, reduce pain, and may extend survival time with cancer. Hypnosis is the oldest Western conception of psychotherapy, but it involves some of our newest understandings of the relationship between brain function and our ability to control pain, anxiety, and the consequences of disease.

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