Hypnosis in Contemporary Medicine

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Hypnosis became popular as a treatment for medical conditions in the late 1700s when effective pharmaceutical and surgical treatment options were limited. To determine whether hypnosis has a role in contemporary medicine, relevant trials and a few case reports are reviewed. Despite substantial variation in techniques among the numerous reports, patients treated with hypnosis experienced substantial benefits for many different medical conditions. An expanded role for hypnosis and a larger study of techniques appear to be indicated.

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AMA = American Medical Association; IBS = irritable bowel syndrome; PET = positron emission tomography

As alternative treatments for medical conditions become popular, contemporary medicine is being challenged to take a more integrative approach. The National Institutes of Health is supporting clinical trials of complementary and alternative medicine, which includes hypnosis. To determine whether hypnosis has a role in present-day medicine, this review evaluates relevant clinical trials involving hypnosis. Some important case reports and reviews are included to give insight into the current and past practice of hypnosis in medicine by professionals. This review pertains to the use of hypnosis for conditions not believed to be primarily psychological (eg, depression, anxiety, attention deficit disorders, and phobias), although the potential for a psychological basis exists for many of these conditions. The intent of this review is to stimulate greater interest in and understanding of the art and science of hypnosis.

The studies reviewed herein were identified by searching the MEDLINE database for articles published between 1966 and 2004; the key words *hypnosis*, *hypnotism*, and *hypnotherapy* were used, as were the specific conditions studied. All studies relevant and applicable to the treatment of the conditions evaluated were reviewed critically and were subsequently included if their conclusions were supported by the data given. Results of controlled trials, review articles, and case reports are presented. In this review, $P<.05$ was considered statistically significant unless otherwise indicated.

WHAT IS HYPNOSIS?

Although no consensus definition of hypnosis exists, the studies reviewed indicate that hypnosis involves the induction of a state of mind in which a person's normal critical or skeptical nature is bypassed, allowing for acceptance of suggestions (Table 1). This state of heightened receptivity for suggestions (induction) is developed with the cooperation of the patient and is followed by the delivery of positive suggestions.[1,2] Hypnosis is also described as an "attentive, receptive focal concentration," with the trance state being a "normal activity of a normal mind," which occurs regularly, as when reading an absorbing book, watching an engrossing movie, daydreaming, or performing monotonous activity.[3] A common assumption is that, during hypnosis, the subconscious mind is in a suggestible state while the conscious mind is distracted or guided to become dormant.

Hypnosis may be compared with meditation, which generally is considered to involve a quieting of the mind. Meditation may be self-directed. If suggestions are given to achieve a desired effect, meditation may qualify as hypnosis depending on the state achieved, particularly because hypnosis can occur naturally (ie, without formal induction).

No attempt is made herein to explain the mechanism of hypnosis for causing the intended changes as a result of the suggestions given. If positive suggestions for change are accepted by the mind, any physiological changes that follow defy explanation by contemporary medicine, although complex explanations have been proposed.[4]

IS HYPNOSIS REAL?

Various methods have been used to determine whether hypnosis is a separate state, distinct from sleep, or if the patient is simply complying with the practitioner's instructions.[3] Volunteers in whom hypnosis was induced were evaluated by positron emission tomography (PET). When subjects were given the suggestion to see color, the color perception areas of their cerebral hemispheres were activated whether they were looking at color or black-and-white patterns. When subjects were given the suggestion to

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TABLE 1. **Characteristics of Hypnosis and a Hypnosis Session**

Hypnosis is a state of mind that occurs naturally or is established by compliance with instructions and is characterized by
Focused attention
Heightened receptivity for suggestions
A bypass of the normal critical nature of the mind
Delivery of acceptable suggestions
A hypnosis session consists of
An explanation of the process and consent
Induction of the trance state
Deepening of the trance
Assessment for adequacy of the trance
Hypnoanalysis—an investigative step (if necessary)
Delivery of acceptable suggestions
Emergence from the trance state

see black and white, the color perception areas of the brain showed decreased activity regardless of what the subjects were viewing. This implies that hypnosis is not a process of simply following instructions but actually involves a change in the brain's perception.[5]

Studies have used other methods, such as electrodermal skin conductance, to evaluate whether patients in whom hypnosis was induced were "lying" or simply complying with instructions.[6,7] Unpleasant sensations were noted on PET to cause activity in the anterior cingulate cortex. Hypnosis induced before painful stimuli caused a decrease in the subjective and objective perception of the pain as noted on the scans.[8] Another study using PET in hypnotized persons showed activation of a region in the right anterior cingulate cortex (Brodmann area 32), an area activated when sound is heard or when sound is suggested in hypnosis but not when sound is simply imagined. This implies that the mind registered the hypnotic hallucination as if it were real.[9] Other studies using PET support the occurrence of distinct changes in the brain with hypnosis.[10] By using electroencephalography, changes were seen during hypnosis that could not be evoked by waking imagination.[11]

Hypnosis does not act as a placebo (administering a pharmacologically inert substance).[12] Studies using hypnosis for anesthesia indicate that pain relief from hypnosis is different from a placebo effect with evidence that the pain is not perceived rather than simply experienced with greater tolerance.[13-15]

Hypnosis is not a state of sleep.[16] Relaxation generally is believed to be a part of hypnosis, but it need not be. Volunteers underwent hypnotic induction with use of either the traditional method involving eye closure, relaxation, and drowsiness encouraged by suggestion or an active, alert method involving riding a stationary bicycle while receiving suggestions for alertness and activity. Equally receptive trance states were achieved by the relaxation and alert methods, and examples were presented of other active, alert trance states.[17] Of note, hypnotized patients may experience considerable anxiety and other emotions while reliving an event with age regression without coming out of the trance state.[18]

Age regression, inducing a person through hypnosis to relive events that occurred earlier in life, is believed to differ from enhancement of memory, but scientific evidence for this assertion is limited. Age regression may be helpful to treat conditions in which an adverse behavior is believed to be based on a past event; however, its validity is controversial. The process of regression may generate strong emotions and can possibly alter a memory or create a false memory. Studies about the use of age regression have reported the development of infantile neurologic reflexes on regression to infancy, age-specific handwriting and vocabularies on regression to childhood, and knowledge of the appropriate day of the week of events in the period to which the person was regressed.[19,20]

A BRIEF HISTORY OF MODERN HYPNOSIS

The era of modern hypnotism began with the Austrian physician Franz Anton Mesmer, who is said to have brought *animal magnetism* (the term for hypnosis at that time) to France in 1778. Because many people were seeking treatment from Mesmer and his colleagues, King Louis XVI of France commissioned Benjamin Franklin and others to investigate the practice. After extensive testing, the commission discredited Mesmer, indicating in their report that any medical benefit was not from magnetism, as publicized, and that *mesmerism* involved only "imagination, imitation, and touch." One account indicates that Thomas Jefferson obtained copies of the report to help prevent the spread of mesmerism to America.[21,22]

This setback for hypnosis led to a deeper, more covert evaluation of the process. James Braid, using eye fixation techniques, was able to produce a trance state and later discovered the importance of adding suggestions. He is credited with introducing the term *hypnotism*, although he favored *monoideism* because he realized that the state differs from sleep.[3] In the 19th century, the English surgeon John Elliotson and the Scottish surgeon James Esdaile performed hundreds of surgical procedures with use of hypnosis for anesthesia and with extremely low morbidity rates for the times.[22] Almost simultaneously with the reports of success with hypnosis, ether and chloroform became popular and displaced the use of hypnosis for anesthesia in surgery.[23,24] Twentieth-century hypnosis was influenced by the contrasting techniques of indirect suggestion intermixed with psychoanalysis promoted by Milton H. Erickson and of direct suggestion and induc-

tion of a deep trance state for age regression espoused by others.[1,2,22]

ACCEPTANCE OF HYPNOSIS IN MEDICINE

Acceptance of hypnosis in medicine has evolved slowly. In 1847, the Roman Catholic Church indicated acceptance of hypnosis, noting that hypnosis was not morally forbidden, and in 1956, Pope Pius XII noted its use for childbirth and indicated the need for proper precautions as for other forms of medical treatment. Other religions (with exceptions) have shown acceptance, with ministers of different faiths trained in and using hypnosis in their practices.[25]

In 1958, the American Medical Association (AMA) published and approved a report from a 2-year study by the Council on Mental Health. The report indicated that there can be "definite and proper uses of hypnosis in medical and dental practice" and recommended the establishment of "necessary training facilities" in the United States.[26] The British Medical Association had issued its report on hypnosis in the *British Medical Journal* in 1955, with which the AMA's Council on Mental Health indicated "essential agreement."[3,26] The American Psychiatric Association, in a position statement approved by the Council of the Association in 1961, indicated that "hypnosis has definite application in the various fields of medicine" and that physicians would be seeking psychiatrists for training in hypnosis.[27] A National Institutes of Health panel issued a statement published by the AMA in 1996 indicating that there was "strong evidence for the use of hypnosis in alleviating pain associated with cancer."[28]

RISKS OF HYPNOSIS

A review of the literature in the late 1980s documented a few cases of patients who displayed "unanticipated" adverse behavior after hypnosis.[18] Adverse reactions or hypnotic complications consisted of "unexpected, unwanted thoughts, feelings or behaviors during or after hypnosis which are inconsistent with agreed goals and interfere with the hypnotic process by impairing optimal mental function." The most common suspected adverse reactions included drowsiness, dizziness, stiffness, headaches, anxiety, and, occasionally, more serious reactions such as symptom substitution and masking of organic disorders. These adverse reactions were attributed to deficiencies in the hypnotist's techniques, such as not realizing that suggestions in hypnosis are accepted literally, bringing the patient too rapidly out of trance, using age regression inappropriately, not dispelling preconceived expectations of negative consequences of hypnosis before initiating the session, or not prescreening for certain psychopathology.[18] A more recent review indicated that hypnosis is associated with a risk of adverse effects, including headache, dizziness, nausea, anxiety, or panic, at levels that might occur in other test or experimental settings without hypnosis. A prehypnosis discussion session with the patient was advocated.[29] It has been argued that informed consent is not needed before casual or brief techniques involving helpful semantics since the use of careless and harmful comments from health care workers has no such prerequisite.[30] Hypnosis generally is considered a "benign process" with "few contraindications"; however, pseudomemories can be created if leading questions are asked during the investigative phase of hypnosis.[16]

EVALUATION OF THE CLINICAL TRIALS

Evaluation of clinical trials of hypnosis is complicated by the nature of hypnosis. The gold standard of a randomized, double-blind, controlled trial is virtually impossible because cooperation and rapport between patient and therapist are needed to achieve a receptive trance state. The few hypnosis trials that were blinded involved suggestions delivered by audiotape during surgery while patients were under general anesthesia (assumed to be a hypnoticlike state). Evaluation of these trials is limited by the lack of standardized techniques for hypnotic induction, evaluation of the level of trance, delivery of suggestions, or number and length of sessions. Although the state of hypnosis involves increased receptivity to acceptable suggestions, the methods of delivering the suggestions vary substantially. In some trials, researchers gave suggestions only for relaxation or no suggestions at all. In other trials, researchers indirectly suggested that patients allow a feeling or imagination rather than directing them to have a certain feeling, which relied on patients understanding the intention. In some studies, researchers gave suggestions only to distract the mind during an otherwise uncomfortable procedure or condition.

Thus, it is reasonable to consider the appropriateness of judging hypnosis by the best or worst results, with use of averaging, or by meta-analyses.[31-34] Indeed, although better methods would be expected to achieve better results, many trials gave too few details about technique to allow comparison. If the most efficacious hypnosis techniques were known, a more representative review of the state of the art may include only trials using such techniques.

A deficiency of the trials reviewed is the lack of randomization of patient and practitioner variables that may affect outcome. Patient characteristics such as fear, attentiveness, interest, expectation, suggestibility, motivation, desire, and belief in hypnosis may alter outcomes. According to the literature, vital practitioner characteristics in-

clude training and experience and the ability to induce trance, to properly word suggestions, and to establish the necessary states of expectancy, rapport, and motivation (if not already present).[1,24,35] Furthermore, results from clinical trials may not accurately estimate the effectiveness achievable in an office setting with willing, expectant patients. In clinical trials, many patients are likely to be unwilling, unmotivated, or skeptical about hypnosis. Hypnosis appears to be "particularly useful and yields better results when it is specifically requested by the patient."[16] Consequently, clinical trials may underestimate the benefits of hypnosis compared with those obtainable by a proficient, experienced hypnotist.

CLINICAL TRIALS OF HYPNOSIS

Allergy

Allergic or hypersensitivity reactions usually are not believed to be psychosomatic and thus are generally considered as unable to be influenced by suggestion. These highly complex reactions involve IgE antibodies, activation of mast cells and basophils, and release of chemical mediators of inflammatory and immune responses. Some early literature suggested that many allergies might have an emotional basis and thus be treatable by hypnosis.[2] Subsequent studies have shown that hypnosis may alter the body's physiological response to various stimuli. In a study of 18 volunteers selected for their hypnotizability, immediate-type hypersensitivity reactions were suppressed in 8 of the 12 patients given brief direct suggestions in hypnosis.[36] In another trial, hypnotic suggestions for relaxation reduced helper/inducer cell percentages, helper/suppressor cell ratios, and natural killer cell activity compared with pre-hypnosis baseline values.[37] Other researchers have shown the positive effects of social support on natural killer cell activity and cortisol levels and the adverse effects of stress in patients with cancer, which has implications for cancer progression.[38]

Skin prick testing for type I (immediate) hypersensitivity and testing with purified protein derivative (in persons vaccinated previously for tuberculosis) for type IV hypersensitivity were performed before and after hypnosis.[39] Patients in the hypnosis group (but not the control group) who were given suggestions for increasing or decreasing skin reactions were able to increase the flare and wheal reactions on 1 arm and decrease the flare reaction on the other, with a significant difference between the 2 arms. The same authors later studied volunteers selected for their high hypnotizability and evaluated their reactions to histamine pin pricks and laser-induced burn pain.[13] Hypnosis was associated with a significant reduction in both pain and flare reactions.

Anesthesia for Pain Relief

Numerous studies have shown benefits of hypnosis for pain relief (Table 2[40-46]). In a study with experimental pain stimulation by pin prick and laser heat, direct suggestions in hypnosis resulted in a significant decrease in pain, measured subjectively and objectively by means of pain-related brain potentials.[13] In another study, highly hypnotizable (based on susceptibility testing) volunteers given painful electrical stimulation were able to increase or decrease their perception of pain as noted on event-related somatosensory potentials.[14]

The mechanism of analgesia from hypnosis appears to differ significantly from a placebo effect and from induced endorphin production (endogenous opiates).[15] The morphine antagonist naloxone does not block the pain relief afforded by hypnosis. In a small study, pain was produced in highly hypnotizable volunteers by inflating a blood pressure cuff on the upper arm to 250 mm Hg followed by exercise and leaving the cuff on for 10 minutes.[40] All patients reported a pain level of 8 or more (on a scale of 0 to 10, with 10 being the most intense) before hypnosis. With hypnosis, all reported a pain level of 0, and this relief was not altered substantially by administration of naloxone.

Hypnosis for pain relief in the clinical setting appears to have similar benefit. In a randomized, double-blind (for the use of naloxone) crossover study, patients with neuropathic pain were taught self-hypnosis.[41] Considerable relief from pain was achieved by hypnosis, and this relief was not reversed by administration of naloxone. In patients with low hypnotizability, hypnosis was equal to placebo for pain relief, whereas highly hypnotizable people benefited more from hypnosis than from placebo.[12] This finding indicates that hypnosis involves at least 2 effects: a placebo-type effect and one in which suggestion distorts perception.

Pain relief afforded by hypnosis differs from that induced by acupuncture.[15] Twenty volunteers were evaluated for the level of pain caused by 2 different experimentally induced methods and were treated subsequently with hypnosis, acupuncture, medication, or placebo.[42] Hypnosis with direct suggestions for pain relief produced significant pain relief compared with placebo ($P<.001$) and gave the best results of all the treatments. The most favorable results with hypnosis tended to be in those who were highly hypnotizable, whereas the results with acupuncture were not related to hypnotizability. Patients with head and neck pain studied in a single crossover trial served as their own controls before and after treatment with hypnosis or acupuncture.[43] Both treatments were effective in relieving pain, although patients believed to have psychogenic pain fared better with hypnosis, and those who were apprehensive about hypnosis had less benefit.

TABLE 2. **Comparison of Clinical Trials of Hypnosis for Analgesia***

Reference	Type of pain	Testing for hypnotizability	Trial		No. of subjects/ patients	Refractory condition	Self-hypnosis or home tapes?‡	Therapy	No. of sessions	Follow-up
			Controlled	Randomized						
Goldstein & Hilgard,[40] 1975	Induced by tourniquet	Yes	Own†	No	3	NA	No	Individual	1	NA
Spiegel & Albert,[41] 1983	Neuropathic	Yes	Own†	Double-blind, cross-over	6	No	Yes	NR	NR	NA
Stern et al,[42] 1977	Induced by ice water or tourniquet	Yes	Own†	No	20	NA	No	Individual	1	NA
Lu et al,[43] 2001	Various: head and neck	Yes	Own†	Cross-over	25	Some	Yes	Individual then audiotapes	3	None
Wakeman & Kaplan,[44] 1978	Burn wounds	No	Yes	Yes	42	No	Yes	Individual then self-hypnosis	Variable	NR
Patterson et al,[45] 1992	Burn wounds	No	Yes	Yes	57	No	No	Individual	1	None
Simon & Lewis,[46] 2000	Temporomandibular disorders	No	Own†	No	23	Yes	Yes	Group	6	6 mo

*NA = not applicable; NR = not reported.
†Patients served as their own controls.
‡Patients encouraged to use either self-hypnosis or audiotapes at home (usually daily).

Many trials have evaluated hypnosis for pain relief for burn injuries. A review of the use of hypnosis for severely burned children encouraged its use for pain and prevention of regressive behavior and included case reports.[47] Clinical trials have shown significant pain relief with hypnosis in patients with burns, many of whom were taught self-hypnosis for pain control.[44,45] In one trial, patients were treated with a single session of hypnosis. Those with severe pain (but not those with less pain) noted significant pain relief compared with controls.[48] As in some other studies, younger patients tended to have better results.[44] Adult patients with recalcitrant temporomandibular joint pain treated with hypnosis with suggestions for jaw relaxation noted significant pain reduction, which persisted at the 6-month follow-up.[46]

A meta-analysis published in 2000 evaluated the use of hypnosis for pain relief in the preceding 20 years.[31] That review of 18 studies indicated that hypnosis offered a moderate to large analgesic effect for many types of pain, which met "the criteria for well established treatment." Because hypnosis was noted to benefit most patients, a broader application of its use was advocated. A 2003 comprehensive review of hypnosis for pain relief found it superior to placebo for acute pain and at times superior to pain relief achieved by other means.[15] Hypnosis for chronic pain was concluded to be a viable option, with the understanding that pain therapy requires "multidimensional assessment and treatment."

Anesthesia for Surgery

Hypnosis has been used as the sole agent of anesthesia for both major and minor surgical procedures. In the 19th century, John Elliotson and James Esdaile reported their successful use of mesmerism for anesthesia in hundreds of operations, with decreased mortality compared with other methods. Nonetheless, they were censored by the medical community at the time for unacceptable techniques. Instead, chloroform, nitrous oxide, and ether won acceptance for general anesthesia.[49]

The use of hypnosis as the sole agent for anesthesia has been virtually abandoned because of the availability and dependability of pharmacological agents; nevertheless, a few such cases have been described in contemporary medical literature. Hypnoanalgesia was described for repair of atrial septal defects in 3 patients and for mitral commissurotomy in 4 patients, with hypnosis as the sole method of anesthesia for 1 of the patients.[50] The patients were able to open and close their eyes on command during surgery and to extubate themselves postoperatively. An oral surgeon documented his own cholecystectomy performed with use of only self-hypnosis for anesthesia.[51] He walked back to his room after surgery and returned to work on the 10th postoperative day.

TABLE 3. **Comparison of Clinical Trials of Hypnosis for Anesthesia***

Reference	Testing for hypnotizability	No. of patients	Self-hypnosis†
Faymonville et al,[52] 1997	No	60	No
Montgomery et al,[53] 2002	No	20	No
Lang et al,[54] 2000	No	241	Yes
Lang et al,[55] 1996	No	30	Yes
Weinstein & Au,[56] 1991	Yes	32	No

*In all these randomized, controlled trials, hypnosis treatment consisted of 1 individual therapy session, and there was no follow-up.
†Patients encouraged to use self-hypnosis during the procedure.

A 1999 review of more than 1650 surgical cases using hypnosis combined with other methods for conscious sedation promoted the safety and patient comfort afforded by hypnosis.[49] This form of anesthesia was used instead of general anesthesia for a broad range of surgical procedures, including thyroidectomy, cervicotomy for hyperparathyroidism, breast augmentation, neck lift, correction of mammary ptosis, nasal septorhinoplasty, débridement with skin grafting, maxillofacial reconstruction, and tubal ligation. The authors concluded that hypnosis prevents pharmacological unconsciousness, allows patient participation, and may allow a faster recovery and a shorter hospital stay but requires some changes in the atmosphere of the operating room because of the conscious state of the patient. Other studies support the multiple benefits of hypnosis as an adjunct to conscious sedation for many types of surgery[49,52] (Table 3[52-56]).

Brief hypnosis has been documented to be beneficial for anesthesia before excisional breast biopsies[53] and invasive radiological procedures.[54] Similar benefit was afforded to patients taught self-hypnosis, which was used during radiological procedures.[55] In a randomized trial, patients hypnotized before and during coronary artery angioplasty required less pain medication and had a mild increase in tolerance to balloon-induced ischemia[56] (Table 3). Benefit was observed, presumably from the relaxed state and from distraction, without specific suggestions given for not feeling discomfort.

Dermatology

Many trials have evaluated hypnosis for eliminating warts (Table 4[57-60]); however, evaluation is complicated by spontaneous remission rates of 20% to 45% and by accounts of warts being produced by suggestion.[61,62] Fourteen patients with bilateral warts for at least 6 months were given direct suggestions for only unilateral clearing of the warts.[57] Of the 10 patients who were able to reach at least a moderate depth of hypnosis (defined in the study), 9 (64% of the total group) achieved complete or near-complete resolution of the warts at 3-month follow-up. The warts on the contralateral side were not affected except in 1 highly hypnotizable person whose contralateral warts resolved 6 weeks later. Hypnosis was advocated to avoid pain and scarring, reactions to anesthetics, and the need for wound care and special equipment. The technique may be particularly applicable for warts in sensitive or inaccessible areas.

In a case report of 41 consecutive patients with predominantly refractory warts, direct suggestions in hypnosis, followed by age-regression techniques for any nonresponders, resulted in a cure rate of 80% with no recurrences.[58] In volunteers with warts on the hand, a significant difference was seen in the rate of remission in those treated with hypnosis (50%) compared with that in the control group (12%).[59] Hypnotizability was not found to be related to successful remission, whereas low expectation for wart regression had a negative association. Volunteers assigned to receive hypnosis had significantly fewer warts at the 6-week follow-up evaluation than did groups treated with either placebo or salicylic acid.[60]

Hypnosis has been used successfully for other dermatologic conditions. Patients with atopic dermatitis noted decreased pruritus, scratching, sleep disturbance, and tension after treatment with hypnosis.[63] In many patients, improvements persisted at follow-up evaluations up to 18 months later. A review of the use of hypnosis in dermatology supports its value for many skin conditions not believed to be under conscious control.[64]

Gastroenterology

Hypnosis for irritable bowel syndrome (IBS) has been studied extensively (Table 5[65-72]). A 1984 study in England showed significant benefits from hypnosis.[65] Thirty patients with refractory IBS and severe symptoms were randomly assigned to 7 individual sessions of hypnotherapy or psychotherapy plus placebo pills. Although the psychotherapy group showed a small but significant improvement in some characteristics, all patients in the hypnosis group had significant improvements ($P<.0001$) in well-being, bowel habits, distention symptoms, and pain, with no re-

TABLE 4. **Comparison of Clinical Trials of Hypnosis for Warts***

Reference	Testing for hypnotizability	Trial		No. of patients	Refractory condition	Self-hypnosis or home tapes†	No. of sessions	Follow-up
		Controlled	Randomized					
Sinclair-Gieben & Chalmers,[57] 1959	Yes	Own‡	No	14	Some	No	Not reported	3 mo
Ewin,[58] 1992	No	No	No	41	Most	No	Variable	6 mo to several years
Spanos et al,[59] 1988	Yes	Yes	Yes	63	No	Yes	1 individual, 1 self	6 wk
Spanos et al,[60] 1990	Yes	Yes	Yes	40	No	Yes	1 individual plus self	6 wk

*In each trial, individual therapy was used.
†Patients encouraged to use either self-hypnosis or audiotapes at home (usually daily).
‡The contralateral side was the control.

lapses at 3-month follow-up. A subsequent report added 35 more patients to the hypnosis group of 15 from the earlier study; those with classic symptoms and no psychological problems fared best with hypnosis, as did patients younger than 50 years.[66] Direct, specific suggestions for symptom relief were most successful. At 18-month follow-up, the 15 patients in the earlier hypnosis group remained in remission.

The positive results with hypnosis for IBS have been confirmed in several other trials.[67-70] It was concluded that "in addition to relieving the symptoms of irritable bowel syndrome, hypnotherapy profoundly improves the patients' quality of life and reduces absenteeism from work."[69] Use of audiotapes for self-hypnosis at home, used in many IBS studies, was considered important for success.[70-73] Other studies and reviews have shown similar results for IBS.[72-74]

Patients with peptic ulcer disease have benefited from hypnosis. Thirty patients with recurrent peptic ulcer disease were treated with ranitidine and were assigned randomly to receive hypnosis or ranitidine alone, initiated after healing was documented by esophagogastroduodenoscopy.[75] During 12 months of monitoring, significantly fewer patients in the hypnosis group (53%) experienced relapse compared with 100% of patients in the ranitidine-only group. The benefit may be from suppression of the secretion of gastric acid, as shown by a study of 32 volunteers who were able to significantly and appropriately increase and decrease gastric acid secretion (compared with their baseline values) from suggestive imagery in hypnosis.[76] In a study of 126 patients with functional dyspepsia, those treated with hypnosis noted improvement in quality of life and long-term symptoms, fewer physician visits, and less health care spending compared with the group treated with medication.[77]

Postoperative gastrointestinal motility has been affected positively by hypnosis. Patients scheduled to undergo abdominal surgery were assigned randomly to either a treat-

TABLE 5. **Comparison of Clinical Trials of Hypnosis for Irritable Bowel Syndrome**

Reference	Testing for hypnotizability	Trial		No. of patients	Refractory condition	Self-hypnosis or home tapes*	Therapy	No. of sessions	Follow-up
		Controlled	Randomized						
Whorwell et al,[65] 1984	No	Yes	Yes	30	Yes	Yes	Individual	7	3 mo
Whorwell et al,[66] 1987	No	No	No	35	Yes	Yes	Individual	≤10	≤18 mo
Harvey et al,[67] 1989	No	No	Yes	33	Yes	Yes	Group vs individual	4	5 mo
Prior et al,[68] 1990	No	Yes	No	30	No	No	Individual	10	3 mo
Houghton et al,[69] 1996	No	Yes	No	50	Yes	Yes	Individual	12	Not reported
Galovski & Blanchard,[70] 1998	Yes	Yes	Yes	12	Some	Yes	Individual	12	5 mo
Vidakovic-Vukic,[71] 1999	No	Own†	No	27	Yes	Yes	Individual	12	Variable
Gonsalkorale et al,[72] 2002	No	Own†	No	250	Yes	Yes	Individual	12	3 mo

*Patients encouraged to use either self-hypnosis or audiotapes at home (usually daily).
†Patients served as their own controls.

ment group read suggestions for an early return of bowel function and appetite or a control group given only general preoperative instructions for an equal period.[78] With their surgeons unaware of the study, patients who were read a 5-minute script before surgery had a significantly earlier return of bowel function ($P<.05$). They also had a shorter mean duration of hospital stay (6.6 vs 8.1 days) and a cost savings of $1200 per patient. Patients in the perioperative state, as well as patients treated in the emergency department, are alleged to be in a highly receptive or hypnoticlike state not requiring formal hypnotic induction.[30,79,80] The use of positive assertions during a situation in which the patient is reliant on and receptive to the health care practitioner, but not in a formal trance state, has been termed *waking hypnosis*.[2]

Hypnosis has been used alone or in combination as anesthesia for liver biopsy, esophagogastroduodenoscopy, and colonoscopy. A gastroenterologist reported the use of only an anesthetic throat spray and hypnosis for 200 upper gastrointestinal tract endoscopy procedures with a reduced overall duration of the procedure.[81] No complications were noted, and patients were able to leave immediately afterward. In another report, patients with either anxiety or allergy to local anesthetics safely underwent liver biopsies with use of hypnosis.[82] Half the patients in a pilot trial reached a moderate or deep level of hypnosis before colonoscopic evaluations,[83] with more than 80% noting only mild or no discomfort.

Healing From Surgery or Injury

Two trials evaluated the potential for hypnotic suggestions to facilitate faster wound healing after injuries or surgery. A pilot trial of hypnosis for patients with nondisplaced ankle fractures showed marginally faster healing, diminished pain, and increased mobility and functionality.[84] Eighteen presurgical patients were assigned randomly to a hypnosis group that received positive suggestions for healing, a control group that received supportive attention to the patients' concerns, or a standard care group. Surgeons were unaware of their treatment group.[85] Patients in the hypnosis group showed significantly improved healing at 1 and 7 weeks postoperatively compared with the other groups ($P<.02$).

Hematology

One medical center reported favorable results with the addition of hypnosis for patients with hemophilia.[86] Patients who were assigned to receive hypnosis had a significantly decreased need for transfusions compared with controls ($P=.01$). A review of this program described the methods and various benefits of teaching self-hypnosis to these patients.

Hypertension

Few studies have evaluated the use of hypnosis for hypertension. In 1 study of 44 patients, the hypnosis group had a significant decrease in blood pressure compared with the control group. At 6 months, the hypnosis group had mean decreases of 13.3 mm Hg systolic and 8.5 mm Hg diastolic below their baseline blood pressures.[87,88]

Neurology

Hypnosis has been used successfully for treatment of headaches. Patients with chronic (≥6 months) tension headaches were assigned randomly to hypnosis or a control group.[89] The hypnosis group had a significant reduction in the number, duration, and intensity of headaches. Instruction in self-hypnosis produced significant benefit for tension headaches in other studies including a group of less hypnotizable patients.[90,91] Hypnosis was compared with propranolol use for children with migraine headaches in a prospective, randomized, controlled, crossover trial.[92] Patients taught self-hypnosis had a decreased frequency of headaches. In another trial, university students with chronic headaches were studied. Hypnosis using imagery for relaxation and serenity was compared with an active placebo that consisted of watching slides falsely claimed to contain potent subliminal messages for pain relief.[93] Both groups achieved significant ($P<.05$) and equal decreases in headache pain compared with controls. Hypnosis did not outperform the placebo; however, the hypnosis group received no specific suggestions for pain relief, whereas the placebo group was given suggestions to expect such benefit (waking hypnosis).

Obesity

Studies of hypnosis as a single treatment for obesity show variable and limited success. A critical review of hypnosis for obesity in studies from 1958 through 1978 concluded that hypnosis may be of benefit but that standardization of methods was needed.[94] In a subsequent trial with 156 participants, results from participants who received 9 weekly individual hypnosis sessions plus behavior-modification treatments were compared with results from those who received behavior-modification treatment alone.[95] On average, the hypnosis group had lost 7 kg of weight more than the control group at the 2-year follow-up. A meta-analysis of trials in the 1980s showed significantly greater weight loss for those treated with hypnosis and behavior therapy compared with those who received behavior therapy alone, and this effect persisted or increased with time ($P<.05$).[96,97] In another trial, 60 obese patients with sleep apnea were assigned randomly to treatment with diet alone or diet and hypnosis.[98] Patients assigned to hypnosis (two 30-minute hypnosis sessions and a home audiotape) achieved signifi-

cant weight loss at 18 months ($P<.02$); however, the sleep apnea was not eliminated. Rather than a sole treatment for obesity, hypnosis may be more helpful as part of a program that includes arousing motivation, dietary counseling, and peer support.[1]

Obstetrics

Hypnosis as anesthesia for childbirth has a long, successful history supported by several trials. A large trial compared a self-hypnosis group with a control group to study the effects of hypnosis on labor.[99] The hypnosis group reported less discomfort and shortened labor. The women's volunteer status and the skill of the hypnotist were factors deemed important for success. Pregnant adolescents were assigned randomly to individual sessions of hypnosis or to supportive counseling with the medical staff blinded to their group assignments.[100] At delivery, the hypnosis group had a significant decrease in complications, fewer surgical interventions, and a shorter hospital stay. Additional positive findings not statistically significant were a decreased need for anesthesia, postpartum analgesia, and infant admissions to the intensive care unit. In another trial, the use of a single session of hypnosis (and encouraging home use of an audiotape) did not induce delivery in postterm women.[101] Patients with hyperemesis gravidarum have benefited from hypnotic intervention, according to 2 reviews with case reports.[102,103]

Oncology

Chemotherapy often is associated with nausea and vomiting. Hypnosis has been studied for reducing these and other adverse effects. Children receiving chemotherapy who were assigned randomly to hypnosis had less anticipatory nausea and vomiting and less vomiting with chemotherapy compared with a control group.[104] A later prospective randomized trial examined the effects of hypnosis for the adverse effects of chemotherapy in children with a resultant significant decrease in anticipatory nausea and the need for antiemetic medications.[105] Children who learned self-hypnosis techniques were believed to have gained feelings of control over their situations.

Hypnosis has been used successfully in other areas of oncology. Patients undergoing bone marrow transplantation treated with hypnosis experienced significantly less oral pain than control patients.[106] Patients with metastatic breast cancer benefited from self-hypnosis and from participation in group support. Despite a lack of specific suggestions, the women benefited with significantly less pain and an increased duration of survival.[107,108] An untapped potential for hypnosis for cancer treatment is the reported ability to alter regional blood flow, which offers the prospect of increasing the delivery of chemotherapy to a tumor or reducing blood flow to it.[61]

Otorhinolaryngology

Patients with chronic tinnitus treated with hypnosis improved significantly in 7 of 10 disturbing symptoms compared with a group treated with masking techniques or supportive measures ($P<.05$).[109] These results support the findings from other trials.

Pulmonary Medicine

Several trials have evaluated hypnosis for asthma. A study of 55 patients with asthma noted that patients assigned randomly to the hypnosis group used bronchodilators less frequently and experienced less wheezing than controls.[110] Those responding best were younger, more compliant with practicing self-hypnosis techniques, and more easily hypnotized, and they developed a deeper level of trance. Males responded as well as females, a finding not consistent in hypnosis trials. A large multicenter trial of patients with asthma reported a significant decrease in the number of treatment failures and a larger number of patients deemed "much improved" by independent assessment in the group taught self-hypnosis.[111] Females in the hypnosis group also had lower wheezing scores and less use of bronchodilators. A retrospective study of asthmatic patients reported similar benefit, with 54% of patients treated with hypnosis having an "excellent" result and 21% becoming symptom free and discontinuing medication.[112]

Decreased rates of hospital admissions, length of stay, and use of corticosteroids were attained with hypnotherapy during the year of study in patients with refractory asthma who served as their own controls.[113] Highly hypnotizable patients assigned randomly to hypnosis for asthma treatment improved significantly in measurements of pulmonary function and noted improved symptoms and less use of bronchodilators compared with a control group.[114]

A few cases have been reported of success with hypnosis in weaning dependent patients from ventilators.[115] The report indicates a potential benefit of hypnosis when other techniques have failed.

Numerous studies have reported various techniques and outcomes in the use of hypnosis for smoking cessation, many with beneficial results.[1] A 1970 study used a single 12-hour group session for volunteer smokers who had unsuccessfully tried other methods of smoking cessation.[116] The program achieved an 88% 1-year abstention rate. In a large trial involving 615 persons unable to quit smoking published the same year, participants were taught self-hypnosis in a single, individual, 45-minute session.[117] A 20% abstention rate was noted by questionnaire at 6 months, counting nonresponders as failures (45% abstention rate in the responders). Further studies patterned after this trial showed 31% to 40% abstention rates at 6 months.[118,119]

In a 1992 meta-analysis of 633 smoking-cessation studies involving almost 72,000 participants, hypnosis was the most successful cessation method, with a 12% to 60% success rate (mean, 36%), 3.5 times that achieved by self-care methods.[33] More aggressive but less acceptable techniques that combined hypnosis with aversion methods (rapid smoking with negative imagery and electrical shocks) for smoking cessation resulted in a 3-month abstention rate of 86% in male volunteers and 87% in female volunteers.[120] Another study that combined hypnosis with aversion methods reported a 90% abstention rate (39 of 43 consecutive referral patients) at 6 to 36 months.[121]

A 2000 review of 59 studies using various techniques for smoking cessation indicated that, although some trials failed to achieve significant benefit, several showed a greater than 50% success rate, with 3 studies (200 participants total) documenting 12-month abstention rates of 63% to 88%.[122] Nevertheless, on the basis of the collective results, the reviewers concluded that hypnosis was only "possibly efficacious." Less benefit was noted in a group of 2810 persons unable to quit smoking (who had previously attempted smoking cessation an average of 7 times) treated with a single 60-minute hypnosis session and encouraged to use a home audiotape.[123] An abstention rate of 22% was found for the previous month in a random sample of participants questioned several months later. In another report, an experienced practitioner of hypnosis reviewed his experience and techniques with 4355 patients, citing an 81% success rate for smoking cessation.[124]

Two studies examined the effect of suggestions for smoking cessation delivered during elective surgery. In a double-blind trial, 122 patients listened to audiotapes during general anesthesia containing either simple, direct suggestions to stop smoking or simple counting without suggestions.[125] After 1 month, significantly more patients in the suggestion group (8 patients) had stopped smoking compared with no patients in the control group ($P<.005$). No patient could actively recall the message on the tape. This study is one of several supporting the assertion that postoperative behavior can be influenced by suggestions given during general anesthesia without conscious recall of the suggestions. In contrast, another trial using a longer, complex message showed no difference in the smoking cessation rate between the treatment and control groups postoperatively.[126]

Rheumatology

Patients with refractory fibromyalgia (mean duration, 8.5 years) who were randomly assigned to receive hypnosis obtained significant improvement compared with those assigned randomly to physical therapy alone.[127] Benefits included improvements in morning fatigue ($P=.003$), sleep ($P<.001$), muscle pain ($P=.004$), overall assessment ($P=.04$), and use of pain medications, with results persisting for at least 6 months.

Surgery

A report from the 1960s indicated that surgical patients should be considered in a state of hypnosis and suggested that patients were able to comprehend much of the conversation around them, even while under anesthesia.[128] In the perioperative state, the patient is fixated on the forthcoming process and is in a receptive, compliant state of mind, comparable to the state formally induced with hypnosis. The article further cautioned that patients in this receptive state may interpret comments made within an audible range as having negative implications for them if these comments are not made correctly.[128] More recently, it has been emphasized again that health care personnel should be aware that patients under anesthesia have unconscious auditory perception and tend to interpret comments negatively.[129] The report also stressed that, along with the potential deleterious effects of this awareness, came the opportunity for using "semantics of positive suggestion" (emphasizing comfort, safety, and success) that should be "an integral part" of surgical and obstetrical care. It appears appropriate to consider the use of suggestions for patients in the perioperative period as a part of the practice of hypnosis.

The subject of awareness under anesthesia is controversial. Much of the medical literature asserts that awareness under general anesthesia occurs only in rare cases, is indicative of an inadequate level of anesthesia, and can cause psychological trauma, presumably from fear induced during the awareness.[130,131] A prospective study examined the possibility of patient awareness of events or comments occurring during anesthesia that may not be recalled consciously.[132] Patients undergoing coronary artery bypass grafting surgery were assigned randomly to listen to either a personalized audiotape with specific instructions to be recalled postoperatively or no tape (control) during surgery. Postoperative hypnosis demonstrated significant ($P=.01$ compared with the control group) recall of material from the audiotape (as well as events during surgery) that was not recalled consciously. Numerous studies support the contention that patients have awareness under anesthesia that can affect their postoperative course.[132]

Because it may be harmful to make comments within the audible range of surgical patients that may be perceived negatively by the patient, promoting good health by making comments of a clearly positive nature appears warranted.[23,24] The "opportunity for positive semantics" was investigated in a randomized, double-blind study in which patients undergoing hysterectomy listened either to an au-

diotape with positive suggestions or to a blank tape while under general anesthesia.[133] The treatment group had significantly fewer bowel problems ($P<.03$), shorter recovery time ($P<.002$), shorter hospital stay ($P<.002$), less fever ($P<.005$), and a better recovery (by nursing assessment) ($P<.002$) than the control patients. Other studies cited in the report indicated not only that "inappropriate or misinterpreted operating theatre comments may have a harmful effect upon recovery," but also that this perioperative awareness "may instead be employed to the benefit of the patient."[133] Compared with matched controls, patients listening to positive suggestions before and during surgery had less blood loss and a shorter recovery.[134] Recommendations for positive semantics for preoperative patients are similar to those applicable to emergency department patients. Persons in both situations appear to be in a hypnotic-like state (receptive, focused, willing to comply) and thus are particularly susceptible to remarks by health care workers.[30,79,80]

Preoperative hypnosis is less controversial than the idea of awareness during anesthesia, with benefit noted in many trials. Significant benefits include less anxiety and decreased blood pressure,[135] reduced blood loss,[135,136] enhanced postoperative well-being,[137] improved intestinal motility,[78] shorter hospital stay,[138] reduced postoperative nausea and vomiting,[139] and reduced need for analgesics.[139,140] Substantial but not statistically significant decreases in cost and length of hospital stay were observed in another study.[78]

A 1991 review of clinical trials using hypnosis, suggestion, or relaxation in the care of surgical patients found that 89% of the trials showed that these techniques produced a positive outcome in facilitating physical or psychological recovery from surgery.[24] The use of live therapists (rather than suggestions from audiotapes) and positive and appropriate semantics (avoiding words that bring to mind undesired outcomes) at the most receptive times were advocated to foster shorter hospital stays, earlier recovery, and improved patient well-being. A meta-analysis published in 2002 evaluated hypnosis for surgical patients for its overall effect and benefits for specific clinical outcomes. Hypnosis as an adjunct to surgery was believed to be "successful for the majority of individuals," with benefits such as decreased pain, anxiety, nausea, and recovery time.[32]

Urology

The medical literature from the 1960s indicated a strong potential for the use of hypnosis for impotence,[2] and support for this assertion has come from recent clinical trials. A review of the personal experience and techniques of an experienced practitioner cited an 88% success rate using hypnosis for impotence in almost 3000 patients.[124] The hypnosis techniques used in this trial were studied in 2 randomized controlled trials of men with nonorganic impotence. One trial that compared hypnosis with placebo showed an 80% improvement in sexual function with hypnosis compared with 36% with placebo.[141] The second trial compared hypnosis with acupuncture and injected or oral placebo. The success rate (moderate improvement or "cure") was 75% for hypnosis.[142] A review of developments in hypnosis reported its efficacy in augmenting other treatment methods for sexual dysfunction and its potential for exploring contributing psychological conflicts.[1]

In a trial of hypnosis for chronic (mean, 7 years) urinary incontinence, 50 women served as their own controls.[143] At 1 month, 58% were symptom-free and another 28% were improved, with cystometric testing at 3 months objectively confirming the benefits.

CONCLUSION

The acceptance of hypnosis as a mode of treatment in medicine is increasing as a result of "careful, methodical, empirical work of many research pioneers."[35] Many important trials reviewed here have helped to establish the role of hypnosis in contemporary medicine. These trials have established the utility and efficacy of hypnosis for several medical conditions, either alone or as part of the treatment regimen. Nonetheless, skepticism may prevail and hypnosis may remain underused because of the tendency to doubt or fear the unknown. According to a recent study, health care providers changed their attitudes significantly and positively when presented with information about the use of hypnosis in medicine.[144] Through greater awareness and acceptance of hypnosis, additional training and research can be inspired in pursuit of improved techniques and new areas of potential benefit.

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