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Better Care for Children in Pain

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Complementary Medical Therapies for Pain Management

Hypnosis and Pediatric Pain Management

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Mind and body practices include a large and diverse group of procedures or techniques administered by trained practitioners. The 2017 NHIS data showed that the use of guided imagery and meditation increased more than threefold from 4.1 percent in 2012 to 14.2 percent in 2017.¹ According to a nationwide survey, Americans spent more than \$30 billion for adults and \$1.9 billion for children out-of-pocket on complementary health approaches.² These approaches include a group of diverse medical and health care systems, practices, and products such as herbal supplements, guided imagery, meditation, chiropractic, and yoga. This amount represents 9.2 percent of all out-of-pocket spending by Americans on health care and 1.1 percent of total health care spending.

Hypnosis is a non-pharmacological technique that enables children to deal with pain by exploring and enhancing their abilities of self-efficacy and self-control. Hypnosis can be

integrated into a variety of medical interventions to improve outcome. Over the past few decades, hypnosis has been successfully utilized to assist children throughout painful medical treatments in the emergency room, and a variety of invasive diagnostic procedures such as bone marrow aspiration and lumbar puncture, as well as for post-operative pain management. It has also been successfully used to treat pain and management of symptoms associated with chronic disorders, such as cancer, asthma, rheumatoid arthritis, migraine headache, cystic fibrosis, sickle cell disease, and burns. This article briefly reviews the concept of hypnosis, the theories and scientific evidence, as well as the practical clinical applications in pediatric pain management.

History

Modern history of current hypnosis began with Franz Anton Mesmer (1734-1815). He was the first physician who introduced this phenomenon to the medical profession. While studying medicine at the [University of Vienna](#), Mesmer published in 1766 his [doctoral dissertation](#) entitled, "*De planetarum influxu in corpus humanum*" (On the Influence of the Planets on the Human Body). In 1778, he moved to France, where he introduced and practiced his new theory and treated patients. Subsequent publications include, "*Memoirre Sur La Decouverte Du Magnetisme Animal*" in 1779.³

The first recorded uses of hypnosis for analgesia and anesthesia occurred in France and the United States, simultaneously but independently, in the 1820's. John Elliotson, famous for introducing the stethoscope to England, published several reports of painless procedures using Mesmerism in 1830. James Esdaile, an English surgeon, performed over 3,000 surgical procedures in India between 1840 and 1850, with the use of Mesmerism as the solo anesthetic. He reported a decrease in mortality rate from 25-50% to an astonishing 5% with the use of hypnosis. James Braid (1795–1860), a Scottish surgeon, used Mesmerism for pain control during surgery. He subsequently wrote a book on the subject entitled '*Neurypnology; or, "The Rationales of Nervous Sleep"*', in which he re-defined the concept of animal magnetism and created the term "*hypnosis*" from the Greek word "*hypnos*" meaning sleep. In his book, James Braid, rejected Mesmer's magnetism theory, and discussed that the phenomenon was based more on suggestibility. Later on, in order to distinguish the state of hypnosis from sleep, he tried to change the name, but the word "hypnosis" became popular and is used to this day.⁴ The mixed reception of hypnosis continued until the first world war, when it was used to treat victims. During the second world war, it served a similar purpose in the treatment of post-traumatic stress disorder. Milton Erickson (1901–1980) and Ernest Hilgard (1904–2001) were among the first investigators in the United States to undertake a modern, systematic approach to hypnosis research.

The British Medical Association officially recognized the use of hypnosis in medicine in 1955 and endorsed the teaching of hypnosis in medical schools. In 1958, the American Medical Association (AMA) published and approved a report from a two-year study by the Council of Mental Health that recognized the definite and proper use of hypnosis in medical and dental practice.⁵ The National Institutes of Health (NIH) issued a statement in 1996 that acknowledged the strong evidence of the use of hypnosis in alleviating pain associated with cancer.⁶

Definition

The American Psychological Association's Division of Psychological Hypnosis defines hypnosis as a "therapeutic procedure in which a health professional makes suggestions that will help a patient experience alterations in perception, sensation, emotion, thought, and/or behavior".⁷ Hypnosis is further defined as a state of inner absorption, concentration and focused narrowed attention. The term hypnosis is different from the term hypnotherapy, as hypnosis itself is not a treatment but rather a tool. [Hypnotherapy](#), in contrast, is a term that describes the clinical use of specific *suggestions*, in order to achieve a specific therapeutic goal. (e.g. alleviate pain).⁸

Myths and misconceptions about hypnosis have limited its use in clinical settings. Eliminating these myths is essential to establishing a strong therapeutic alliance and a positive expectation for patients and their families, as well as clinicians. Contrary to the myths, all hypnosis is self-hypnosis. There is NO mind control. Hypnosis cannot force anyone to do anything against his or her will or values. During hypnosis, the patient remains aware of the process, and unless amnesia has been specifically suggested, he or she will remember most, if not all of the hypnosis session. Hypnotic subjects are not immobilized. In fact, during a session, a child frequently will wriggle, shift, cough, speak, or open their eyes. Subjects hear the surrounding sounds; remain oriented as to person, place, and time; and can even hold a conversation while in trance.⁹

Hypnosis Components

Children are excellent hypnotic subjects because of their vivid imaginations, desire for mastery of new experiences and the ease with which they intertwine fantasy and reality.¹⁰ In fact, children are capable of going into hypnosis spontaneously, without any help. There are fewer clear distinctions between the phases of hypnosis in children, compared with adults. A typical hypnosis session in adults and adolescents consists of induction, deepening of the trance state, delivery of specific suggestions and finally re-emergence.

The induction phase assists to focus the patient's attention. The length and the manner that one achieves this phase in children vary according to the nature of the problem, the child's developmental age, learning style, interests and strengths. Parental cooperation,

and that of the pain management team, is crucial to achieving success. In general, children respond to a large variety of hypnotic induction techniques. These methods and strategies include eye fixation and guided imagery, using visual images of a favorite place, auditory images of a favorite song or movement images such as a flying blanket or sport activity. Additional techniques include storytelling, ideomotor activities such as arm levitation and progressive muscle relaxation. Middle school children like to use a videogame fantasy. As mentioned earlier, compared to adults, young children have a tendency to keep their eyes open, move and make spontaneous comments throughout hypnotic procedures. These acts simply show that the child is adopting the procedure into his/her own behavioral style and is not sign of resistance.

Neuro Imaging Correlates in Hypnotic Analgesia

Multiple anatomic regions, (e.g.; the primary and secondary somatosensory cortex, anterior cingulate cortex, basal ganglia, and anterior frontal cortex) are involved and communicate in perception of pain.¹¹ Psychological factors, such as "anticipation" and "context" have shown to be as important as, the intensity of the stimulus in the experience of pain.^{12,13} Neuro-imaging studies show that the mere *anticipation* of a painful stimulus, in spite of the absence of direct physical stimulus can activate various areas of the brain.¹⁴ The modulation of pain by hypnosis is different from relaxation, cognitive coping, or a placebo-like mechanism.^{15,16} Rainville et al., studied selective hypnotic suggestions to alter the unpleasantness of a painful stimulus, without changing the perceived intensity using PET scan.

The study showed significant changes in pain-evoked activity within the anterior cingulate cortex (ACC) , consistent with the encoding of perceived unpleasantness, without any changes in primary somato-sensory cortex activation. The same group also demonstrated that hypnosis is associated with a significant increase in occipital regional cerebral blood flow (rCBF) and EEG delta activity. Based on these findings, they propose that hypnosis is modulated by brain structures centrally involved in the regulation of consciousness.^{17,18} Multiple investigations suggest that hypnosis is effective through modulation of cerebral structures within the frontal lobe and ACC, which are responsible for "attention"¹⁹ In addition, there seems to be a positive correlation between dopamine levels (the main neurotransmitter responsible for attention) and measured hypnotizability.²¹ These findings provide supporting evidence for the involvement of the thalamo-cortical attentional network in hypnosis.^{22,23}

Introducing Hypnosis

The first step in developing any treatment plan is a medical evaluation for diagnosis. Patients with chronic pain conditions need to be frequently evaluated to update the course of the disease and the effect of treatment. Prior to using hypnotic intervention,

the clinician must demystify the process for the patient and his or her family, addressing and correcting any misconceptions that may lead to avoidance or poor adherence. Parents should be involved in a positive manner early in the process as their conceptions regarding hypnosis may either impede or assist in their child's therapy. Parents should recognize that all hypnosis is self-hypnosis, and that the clinician's role is to *guide* the child during the intervention. In fact, their child's interest to learn the skill and the motivation to change are essential factors for successful treatment.

Frequently, parents can provide valuable information regarding their child's learning style, strengths and weaknesses, which assists in the choice of an appropriate therapeutic plan. The clinician must also explain the plan to the child in appropriate language, tailored to the child's developmental level, learning style and interests. Some adolescents require a lengthy descriptive explanation of pain pathways, whereas a brief explanation with pictures or videotape may be adequate for younger.

Hypnotic Induction Techniques

A clinician's ultimate goal in use of hypnosis is to alter the child from the relatively helpless and passive state, to a state of empowerment, self-mastery and control. Clinicians must avoid the temptation to impose their own imagery on the child. Instead they should use child's interests, strengths and internal resources to solve problems. Many different techniques may be successfully used in pain management. The following techniques are brief examples of some hypnotic induction techniques and analgesic suggestions used with children and are based on the above reference.

1. Imagery - Children do not have to close their eyes unless they wish to do so. They can be encouraged to talk during the imagery or to nod their head during the session. Younger children may want to move around during the hypnosis session, especially if they are imagining their favorite activity. Imagery can be about a favorite place, favorite activity or favorite song.
2. Ideomotor techniques - Moving hands together or arm rigidity
3. Progressive relaxation - Concentrating) on breathing or relaxing an specific muscle

Hypnotic Suggestions for Analgesia

Many analgesic suggestion options are available and effective, especially when the technique is tailored to the child's interests and internal resources. Once the patient has learned hypnotic inductions and enjoys experiencing that favorite place or activity, then the clinician delivers the appropriate suggestions, which have come to light during child's assessment.

Some examples of analgesic suggestions are described below.

1. Magic Glove: One of the hypnotic pain management techniques that aims to decrease a child's pain is the "Magic Glove" introduced by Jacobsen as an acute pain intervention for blood draws. The "Magic Glove" technique is especially helpful for children age three to 12 years undergoing blood draws, intravenous catheter placement, vaccinations or emergency room suture procedures.¹
2. Sensory transformation
 - A. Changing the intensity of pain; *"See the pain scale from 0 to 10 in your mind... adjust it by lowering your pain's rating. Make your pain move down the scale. If it is 10, move it to 5.*
 - B. *"See yourself in a cold arctic place... where you can blow a refreshing cold arctic air through that hot burning area..."*
3. Distraction
4. Transference - Transferring the pain to a smaller or less vulnerable area
5. Relaxation
6. Storytelling - Any of the above hypnotic suggestions can be incorporated in to a story. Stories can be about another child, a teddy bear, a favorite doll or animal that was able to successfully utilize a certain technique to overcome the discomfort.

Teaching Self-Hypnosis

Self-hypnosis increases the child's sense of mastery and control and reinforces the desired behavior by repetition of the appropriate exercise. Encouraging the child to practice the learned skill is essential to a successful outcome.

Training and Certification in Hypnosis

The American Society of Clinical Hypnosis (ASCH) and the Society for Clinical and Experimental Hypnosis (SCEH) limit their training to health care providers. Both SCEH and ASCH hold workshops for intensive training in basic, intermediate and advanced skills in hypnosis. Both societies hold annual scientific meetings to discuss recent developments in clinical and experimental research.

The National Pediatric Hypnosis Training Institute (NPHTI) is the organization that provides education and skill development in clinical hypnosis and hypnotherapy for health care professionals who work in pediatric settings. They offer workshops in introductory, intermediate, and advanced pediatric hypnosis.

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