

Let Magic Happen: Adventures in Healing with a Holistic Radiologist

Chapter 7: Anodyne Means No Pain

Someday, after mastering the winds, the waves, the tides and gravity we shall harness for God the energies of love and then, for a second time in the history of the world, man will have discovered fire.

—Pierre Teilhard de Chardin

Donna Hamilton is an amateur flying trapeze artist from California who also happens to be a skilled interventional radiology tech-turned hypnotherapist. I invited her to Duke in 1995 to demonstrate Anodyne Imagery, an alternative approach to sedation for medical procedures. Her first case in our radiology department was a classic North Carolina patient named Jean Windom, an elderly woman with lung cancer from smoking. Arriving in the angiography suite, Mrs. Windom half jokingly said her only allergy was to pain. This made her the ideal candidate to assess the effectiveness of Donna's technique, as anodyne means "no pain."

Interventional radiologist Cynthia Payne (her real name, no pun intended) was preparing to do a Port-A-Cath placement for Mrs. Windom's intravenous chemotherapy treatments. This involved threading a catheter into the subclavian vein in her chest followed by minor surgery to implant the reservoir. The procedure, which includes multiple forceful passes with progressively larger instruments under the clavicle to dilate the track for the catheter through the chest wall into the vein, usually requires a considerable amount of sedation with intravenous Versed (a short-acting drug similar to Valium) for anxiety and Fentanyl (a short-acting narcotic) for pain.

Donna and I had originally met in 1992 in Virginia Beach when she was taking a sabbatical from radiology to pursue more natural approaches to healing and pain relief. I invited

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her to give a talk to my MRI techs on the benefits of hypnosis. Subsequently, Donna was offered an interventional radiology contract position at the Palo Alto VA Hospital in California, where she developed Anodyne Imagery, which is based on her training in neuro-linguistic programming (NLP). Derived from hypnosis theory, NLP is a model of interpersonal communication used to create successful behavior changes.

The skillful use of language in Anodyne Imagery elicits the desired outcome, with an emphasis on positive or neutral phrases. For example, language typically used during a radiology procedure includes describing the initial injection of local anesthetic as “a little bee sting that burns.” Since most people don’t consider a bee sting to be “little,” this has the effect of creating a painful response. Changing the words to “notice the sensation from the numbing medication and how quickly the area becomes numb” creates a more comfortable experience. Donna’s approach impressed interventional radiologist Elvira Lang, who decided to further research, test, and offer mind-body interventions to her patients. Their work together led to the publication of their first article in 1994 in the *American Journal of Roentgenology*.

Donna sent me a copy of her paper, “Anodyne Imagery: An Alternative to IV Sedation in Interventional Radiology.”ⁱ I thought this was a good choice of title, as “anodyne” sounds kind of high-tech, and imagery was a more marketable term than NLP or hypnosis at the time. Dr. Lang actually found the term in a thesaurus, and was pleased that it fit the pain application perfectly. Their results were impressive enough that I thought I could convince my Duke colleagues to explore Anodyne Imagery further. Doing so would require expansion of their conservative belief systems. I immediately invited Donna to visit me at Duke with the intention of making this unique approach available to our patients.

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Thanks to our open-minded radiology chairman Carl Ravin, I arranged for her to spend a week working with patients in the department. She would have the opportunity to demonstrate Anodyne Imagery to the staff and give a radiology grand rounds presentation. It was unprecedented for an X-ray tech to give such a talk, but it was also unusual for her to be co-author of a paper in a prestigious journal. Working with patients also required her to be granted temporary hospital credentialing privileges. We thus spent some time preparing for the talk and for her integration into the department where procedures were performed in the time-honored “Duke way.”

I also searched the faculty for the most outside-the-box thinkers who might be willing to let Donna work with them during procedures. Dr. Payne, always seeking new ways to improve results for her patients, was the first to accept my invitation. When Donna introduced herself to Mrs. Windom, she asked the elderly woman where she “preferred to be.” She immediately responded she had just been on a wonderful trip to Hawaii. Suggesting that she could “go there now” and take a free imagery trip to Hawaii during the procedure, Donna taught her “the relaxation breath” and then incorporated different facets of the procedure on the X-ray table into the beach imagery. Mrs. Windom quickly got very involved in her internal images of lying on the warm sand under the sun instead of on a hard cold table under a big X-ray tube.

Dr. Payne began the process of vigorously dilating the track through the chest wall for the catheter. Donna suggested to Mrs. Windom that the added pressure would just cause her to more deeply relax into the sand. Even Cynthia got into the act when she irrigated the wound with copious amounts of saline solution by saying, “Here comes another wave.” At the end of the procedure, she was amazed to discover that Mrs. Windom had not required any Versed and only needed half as much Fentanyl as usual. Cynthia expressed concern about whether her patient had

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been comfortable during the procedure, but afterwards Mrs. Windom exclaimed, “It was wonderful!” She was the first of many satisfied Anodyne Imagery customers at Duke.

The Internal Pharmacy

Donna was as adept at feats of derring-do in the academic arena as she was in the angiography room or on the trapeze. Her grand rounds presentation was two days later, and the auditorium was filled with faculty and residents, some of whom were skeptical and others just curious due to news about her work with Cynthia Payne. To develop rapport with her left-brained audience, Donna first reviewed the scientific results from the 21 patients in her paper. Then she described the first anxious and angry patient she had worked with in Palo Alto. This was a man who had severe chronic pain after multiple bowel resections and needed to have a feeding tube exchanged through a track in his abdominal wall.

Donna had gone in to meet this patient before the procedure. He was extremely anxious and experiencing a lot of pain and demanded the same amount of medication he had been given during a previous tube exchange. She assured him she was there for him, and he could have whatever he needed during the procedure. Then she asked him if he'd like to use his own “internal pharmacy” for comfort. When she invited him to allow an image to come up that represented the pain, he said, “It’s a huge piece of red raw meat with a butcher knife stuck in it.” She asked him to change the image to make it more comfortable. He moved the image further away and made it black and white, then turned the knife into a toy knife and removed it. These changes allowed him to relax. They also gave him a sense of control over his pain for the first time and significantly reduced his use of medication. With Dr. Lang's encouragement and support, Donna was enabled to use these skills on other patients at the VA Hospital.

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That first case was impressive, but then Donna shared a story with us that really got my attention. This concerned a claustrophobic patient undergoing MRI. His images were degraded by motion artifacts. She had the MRI scans to prove it. As she spoke, she showed scans made before and after Anodyne Imagery, which demonstrated a marked improvement in image quality. I was intrigued because claustrophobia had always been a challenging issue for the MRI safety committee. There was no such thing as a wide bore or open magnet back then, and many patients described the experience as being in a “coffin that makes noise.”

The standard approach at that time was to give patients concerned about the confining atmosphere of the scanner Valium to take by mouth ahead of time, but this yielded inconsistent results. Intravenous Valium worked better, except for the potential side effect of patients forgetting to breathe when they were in the magnet. (Occasional breathing is definitely recommended during a scan that could last up to an hour.) Patients also had to remain in the department for hours after the study waiting for the medication to wear off. Having an alternative nonpharmacological method of coping with claustrophobia would be useful. I was sure patients would appreciate it.

Donna’s talk went exceptionally well and concluded with a group imagery experience for the entire staff in attendance. We were pleased with the enthusiastic reception. Ultrasound specialist Mark Kliewer, for example, went right from the talk to his next interventional procedure, used the technique on his own without further instruction, and got excellent results. Others said they would need more instruction before they were ready to use it for their procedures, and so there was much discussion about bringing her back to do a formal training for the staff.

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The grand finale of the week came the next day when Terry Alford, a local architect, arrived for a special angiographic procedure by neuroradiologist Linda Gray. There had already been much hype during the week regarding his case, as he was very anxious. He had been diagnosed with a brain aneurysm. Linda needed to do a test occlusion of the artery feeding it by temporarily blocking the blood flow to that part of his brain before he could be scheduled for surgery, and he would need to be awake and alert during the procedure so they could monitor the results. Both this procedure and the corrective surgery carried a significant risk of stroke.

Donna and I arrived to find Terry sitting in the waiting room, fully dressed in a big overcoat, with his arms folded tightly across his chest. Very negative body language! Using rapport skills derived from NLP to put him at ease, she crossed her arms like his and then gradually shifted to an open position. Establishing rapport can be accomplished by subtly mirroring a patient's gestures, words, voice quality, or behavior in a way that communicates acceptance on a subconscious level. This process can be distinguished from mimicry as it occurs without exaggeration and below the level of conscious awareness. If you pace a person three times by matching them in three ways, it is possible to lead them toward a shared goal. As they proceeded to work together, Donna soon found that, thanks to his professional expertise, Terry was actually very skilled at visual imagery.

As the procedure started, Terry imagined sitting on the porch of his condo at Bald Head Island, North Carolina, painting the sunset with geese flying over. Dr. Gray, a gifted angiographer, delicately threaded a catheter through an artery in his groin all the way up into the base of the brain. While we all held our breath, she successfully did the test occlusion of the vertebral artery. The whole procedure went very smoothly as Linda performed the intricate

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catheter manipulation with her typical intuitive skill. While Linda worked, Donna also taught Terry how to lower his blood pressure to normal for the first time in months.

Terry and his wife Nancy, who also was very open to alternative approaches, were ecstatic about the results. But Donna had to rush to the airport to catch her plane back to California that afternoon. The Alford's' immediate thought was to have her work with Terry during the upcoming surgery, so they arranged to fly her back the next week to guide him through the aneurysm surgery. Neurosurgeon Alan Friedman was open-minded enough to support the process, and Terry sailed through the procedure by using his new-found breath and imagery skills for pain relief rather than morphine. He made a quick recovery and was out of the Neuro ICU in record time.

Anodyne Pioneers at Duke

Based on this introduction to Anodyne Imagery, I got funding from Carl Ravin to bring Donna back to lead a two-week training for the radiology staff, including nurses, techs, and physicians. A few months later, an adventurous dozen of us spent two consecutive weekends learning and experiencing the entire approach. During the week in between, Donna and her partner John Pateros were available for consultation. They roamed around the department to supervise our fledgling attempts at applying what we had learned, and we also had daily group debriefing sessions.

Radiology nurse Melissa Holbrook reported accompanying an anxious patient who was extremely short of breath to the CT scanner. When a pneumothorax (a partially collapsed lung with an air leak) was detected, a surgeon was called to put in a chest tube and reinflate the lung. While she waited for him to answer his page, Melissa began stroking the patient's forehead at the

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same rate as his rapid breathing. Then, using nonverbal pacing, she gradually slowed down, and, amazingly, by the time the surgeon arrived the patient was breathing at a normal rate.

MRI tech Ann Charles also had a patient with an unusual breathing problem in for a scan. This patient had a rare condition known as relapsing polychondritis, where the cartilage throughout the body starts to dissolve and disintegrate. When she lay down flat, the cartilage in her trachea would spontaneously collapse, making her panic and gasp for air. She said there was no way she would be able to lie down for an entire hour in the scanner. When Ann asked her if there was anything about the sound of the MRI that might assist her in getting through the scan, she said it reminded her of an old rickety fan that could blow enough air into the trachea to keep it open. When she began using this image, her breathing immediately improved to the point where she could lie down long enough to complete the scan.

Another of Ann's MRI patients was a skeptical physics professor with severe shoulder pain. Like the previous patient, he could not lie down comfortably in the magnet. He really wasn't interested in any "California woo-woo stuff," he said, but he was highly motivated to find out what was wrong with his shoulder. Ann realized she needed a more technical approach to gain rapport with his analytical mindset, so she asked him to imagine holding manually operated digital pain and anxiety meters in his hands. She got him to dial down the meter readings, first one side, then the other, until he was able to reduce them enough to complete the scan.

I had a non-English-speaking, Hispanic patient, who came for an ankle arthrogram (a procedure requiring a potentially painful injection). He had severe reflex sympathetic dystrophy, a painful syndrome that makes the lightest touch to the skin intolerable. An ankle arthrogram was challenging enough without this extra dimension of difficulty, so I asked the interpreter to find out where the patient would rather be instead of on the X-ray table having this procedure. The

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patient enthusiastically said he would rather be at his favorite restaurant eating a sumptuous dinner. He imagined eating a five-course meal while I put a big needle into his ankle, injected iodine contrast, and took films. He was very comfortable without any mention of pain whatsoever.

Considering our lack of background in Donna's approach, our results with patients were quite remarkable. Chuck Spritzer, who also took the training, found it to be particularly useful in dealing with claustrophobic patients. When Ann wasn't available, the other techs called him to assist with their patients. This ability was particularly helpful when the patients didn't realize they had claustrophobia until they actually saw the small bore of the magnet tunnel. With such cases, no preparation for Valium sedation could be made in advance. The patients were particularly pleased to be empowered to handle their fears without drugs and to be able to drive home afterward without waiting a long time for the Valium to wear off.

Mammography specialist Ruth Walsh found Anodyne Imagery useful for breast biopsies and learned an important lesson during a biopsy about letting patients choose their own preferred places. She suggested that the patient might find it relaxing to imagine going to the beach. The recommended approach we were taught was simply asking in a nonspecific fashion where a patient wanted to go. But this patient started crying. Ruth made the appropriate, skillful response by asking, "What are you experiencing?" "My husband died at the beach last summer," the patient said. "Well, choose another place that is more comfortable for you," Ruth replied. The patient went somewhere else and relaxed sufficiently to finish the biopsy.

During the week Donna was at Duke, I also took her to meet key faculty in other departments in the hospital. This was to lay the foundation for a future hospital-wide training. We were fortunate to find a couple open-minded staff members who were willing to explore

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alternative approaches. She wound up doing a bronchoscopy with pulmonologist Peter Kussin without any sedation for the patient and an endoscopy with gastroenterologist Paul Jowell at the VA Hospital, also without sedation. These unprecedented experiences were instrumental in helping us get funding for additional trainings.

Synergistic Possibilities

Donna and John returned later in 1995 for another two-week training, which was open to staff from the entire medical center. This time, we had 25 nurses, techs and physicians from throughout the hospital. This training created many synergistic possibilities. The most interesting result was when patients who had already learned Anodyne Imagery from another practitioner on one of the clinical floors of the hospital arrived in the radiology department. For me, this represented my ultimate goal of creating a culture of patient empowerment in a major medical center.

My most dramatic example came as a result of a request I got from Duke trustee Edwin Jones Jr., who asked me to visit his friend, urologist Larry Boggs. Larry had been admitted for prostate cancer treatment, and I went to see him in his hospital room. He wanted to learn Anodyne Imagery to use during a minor skin biopsy he was having that afternoon. As his preferred place, he picked a location in Bhutan in the Himalayan mountains. He had once climbed there for the breathtaking view of the Taktsang Palphug Monastery across the valley on a narrow ledge called the Tiger's Lair. His description of the temple grounds and spectacular view was quite detailed and vivid, as if he were actually there.

Larry was naturally talented at using imagery. When I came back to see him a few days later, he had just returned from the radiology department after a drainage procedure on his

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kidneys, during which he had again traveled to the Himalayas. He had performed many such catheter procedures on his own urology patients, and he surprised the radiology staff by announcing he had just learned an imagery method he could use for pain control without medication. Like Mrs. Windom, Larry also used the technique during replacement of his Port-a-Cath with the assistance of one of our Anodyne Imagery nurses. That kind of magic started happening all around the hospital in unexpected ways.

The most surprising result came from the least likely participant in the training, urologist John Weinerth, one of the most experienced senior surgeons in the hospital. He and his wife, Peggy Bridges, who worked as his urology nurse, took the training together, then applied Anodyne Imagery as a team during urology procedures. For those of you who have never seen one, a cystoscopy is considered a scary experience where a large tube is inserted into the small urethral orifice. Patients with chronic urological problems may need to have it repeated on numerous occasions.

John had a rather gruff demeanor, like a Marine drill sergeant with a low growling voice, and most of his patients were anxious and hyper before their cystoscopies. During the Anodyne Imagery training, he learned rapport skills that allowed him to shift the tone of his voice to match and pace the high-pitched anxiety in his patients' voices. Then he would lower his voice and lead them to a more relaxed state. Working in tandem with Peggy made the process even more powerful. They were able to do the procedures quickly and safely with less medication.

One of John's patients had a history of multiple outpatient surgeries for kidney stone removal. She always had to be admitted to the hospital afterwards for nausea from the anesthetic medications. Using an Anodyne Imagery technique, John gave her preoperative suggestions, suggesting that she would become hungry for her favorite food right after the procedure. In the

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recovery room, she asked to have her nasogastric tube removed right away. She had no nausea and was ready for her first meal soon afterward. This kind of outcome resulted in significant cost savings by eliminating overnight stays in the hospital.

After the training, I did a survey of the practitioners to see what impact Anodyne Imagery had on their practices. John commented that whereas he had spent a few thousand dollars to learn a new surgical technique he had only used on a couple patients in the past year, he had learned Anodyne Imagery for free and used it with every patient every day as an integral part of his practice. The difference in value, he added, was of several orders of magnitude. It took his clinical practice, which was already characterized by a high degree of technical skill, to a whole new level of effectiveness.

Cardiology nurse practitioner Laura Blue used Anodyne Imagery every day with dozens of anxious patients waiting for heart transplants. Many of her patients were severely ill and in desperate straits. A lot of her interactions were over the phone, where the communication skills worked as well as they did in person. When a major TV news station did a story on Anodyne Imagery at Duke in 1996, they interviewed Laura, who said in her classic Southern drawl, “Ah used to dread those encounters with anxious patients, but now, ah don’t.”

Cardiology nurse Suzanne Crater from the Durham VA Hospital also participated in the training and incorporated Anodyne Imagery in the MANTRA Project she and cardiologist Mitch Krucoff led at the hospital. They developed a customized imagery script that was used by the team of healers who interacted with Mitch’s interventional cardiology patients. Suzanne arranged for an additional training at the VA Hospital in 1996, which included members of the anesthesiology department. We later estimated that Anodyne Imagery used in both hospitals positively impacted more than 1,000 patient interactions per week.

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Terry Alford's imagery experience of geese flying at sunset became the inspiration for the cover picture on the April, 1996, issue of *Inside Duke University Medical Center*. His story and many others were featured in an article titled "Anodyne Imagery: Getting Away From Anxiety." The possibilities in 1996 seemed limitless. We began developing a plan to create an Anodyne Imagery training center based at Duke.

An article I wrote that year titled "New Vistas for Anodyne Imagery" got published in the *Radiology Administrative Journal*.ⁱⁱ Then I presented a paper titled "Anodyne Imagery for Musculoskeletal Radiologic Procedures" at the Society of Skeletal Radiology annual meeting. Ann Charles, Chuck Spritzer, and I next created a research project to study claustrophobic patients in MRI. It was a randomized controlled trial of Anodyne Imagery versus standard sedation, which finally got approved by the institutional review board after months of revisions. We managed to jump through all the hoops required in academia to begin to acquire the data necessary to shift the status quo in the management of anxious patients.

There were other related academic projects. Melissa Holbrook did her nursing master's thesis on Anodyne Imagery. One of my medical students did a cost-effectiveness analysis project that showed the possibility for saving thousands of dollars on medical and surgical procedures by training additional practitioners in the medical center. The impact in the operating room alone would pay for the cost of future trainings on a large scale. We even had the support of Duke Medical Center chancellor Ralph Snyderman, who was impressed by the many positive reports from practitioners and patients.

Unfortunately, in 1997, our vision of Anodyne Imagery for Duke completely fell apart in a short period of time. Ann did one patient in the research project, then seriously injured her own shoulder wrenching open a stuck magnet door and went out on disability. Donna and John

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presented a business plan for a training center at Duke to the administration, but it was rejected during a period of budget cutbacks. Donna dissolved the partnership with John shortly afterward and took her high-flying act to the streets to share Anodyne Imagery with anyone she encountered who needed help. Since then, she has expanded her vision to make it available for everyone everywhere through www.anodyneisfree.com.

All Hypnosis Is Self-Hypnosis

Elvira Lang, the radiologist Donna collaborated with on her first paper, moved to Harvard to do extensive research on nonpharmacological analgesia and self-hypnotic relaxation. She has published numerous papers showing significant benefits and cost-effectiveness for mind-body interventions during angiographic procedures, breast biopsies, and MRI. Her work with psychologist Eleanor Laser is been summarized in a 2009 book, *Patient Sedation without Medication*.ⁱⁱⁱ One of her papers showed a 40 percent reduction in the noncompletion rate for claustrophobic patients; this translated into an annual savings of \$120,000 for a large, private practice MRI group.^{iv} Inspired by her research, I set up a webinar for the MRI techs in the network of NationalRad, the teleradiology group that I joined after leaving Duke in 2004. It was patterned after an Anodyne Imagery introduction I had done for Duke medical students prior to their first time performing procedures on the clinical wards. The goal was to provide very basic skills for creating a more holistic approach to our patients across the country.

My own imagery work evolved into formal hypnosis training with counseling educator and therapist Holly Forester-Miller, from Medical Hypnosis Consultants. Holly, who is director and coordinator for an annual weekend workshop approved by the American Society of Clinical Hypnosis (ASCH), routinely brings in talented faculty from around the country to assist her in

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teaching. Much to my surprise, the faculty included one of my old medical school professors, Charles Srodes, whom I knew only as a compassionate oncologist, not a hypnotherapist.

Completing the basic and intermediate workshops allowed me to take the required consultation hours with Holly to qualify for my ASCH certification in 2011.

In addition to being an excellent teacher of hypnosis, Holly's claim to fame is having had major surgery under hypnosis and without anesthesia. She'd had difficulties with anesthesia during a Caesarian section and therefore refused surgery for a later abdominal hernia operation. When she met hypnotherapist and dentist Kay Thompson, a student of legendary hypnotherapist Milton Erickson, she learned that she could have the hernia repaired while using self-hypnosis. As Holly frequently points out in her lectures, all hypnosis is self-hypnosis. First you must be willing to be hypnotized. Second, you have to be motivated. In her case, she had strong motivation. She had two surgeries in West Virginia using only self-hypnosis, with stand-by anesthesiology that wasn't needed. Her second procedure was videotaped. She showed the video on many occasions to my students at Duke, where she eventually became an instructor for first and second-year medical students. Although I assumed she would be in a deep trance during the actual procedure, the videotape shows her wide awake and talking as the surgeon makes the first incision. She, in fact, makes jokes about being sure he was using the best silk sutures. Remarkably, there is no measurable blood loss during the procedure, and the usual electrocautery for bleeding vessels is not used. She directed the blood from the incision to go elsewhere in her body so it would not be wasted. I would not have believed the story if I hadn't seen the video. I'm sure the students felt the same way.

There have actually been quite a few randomized, controlled trials documenting the benefits of hypnosis in the surgical arena.^v These studies show decreased blood loss and

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postoperative pain with accelerated recovery time for preoperative hypnosis. Although few patients actually want to be awake like Holly during their procedures, many want to improve their outcomes with effective hypnotic preparation for surgery. Based on Holly's suggestions, I have made CD's for patients to listen to before their operations. It does seem to make a difference. It has always puzzled me why managed care companies and insurance companies don't require routine preoperative hypnosis as a cost-saving measure.

In her hypnosis courses Holly often tells the story of a Scottish surgeon named James Esdaile, author of *Hypnosis in Medicine and Surgery*, originally published in 1846 as *Mesmerism in India, and its Practical Application in Surgery and Medicine*.^{vi} Esdaile, a protégé of mesmeric intuitive diagnosis pioneer John Elliotson, operated on 300 convicts in India under hypnosis. He had a five percent mortality rate at a time when surgical mortality was usually about 40 percent. However, ether was discovered in 1846 just before Esdaile's book was published, and chemical anesthetics were rapidly adopted, despite the risk that some patients would die from the occasional overdose. Perhaps if ether had not been discovered until 1946, this chapter would have concluded with mention of chemical anesthesia as a possible alternative to standard surgical hypnosis.

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ⁱ Elvira V. Lang and Donna Hamilton., “Anodyne Imagery: An Alternative to IV Sedation in Interventional Radiology,” *American Journal of Roentgenology* 162 (1994): 1221-1226.

ⁱⁱ D. L. Burk, Jr., “New Vistas for Anodyne Imagery,” *Administrative Radiology Journal*, (July 1996): 38-40.

ⁱⁱⁱ Elvira Lang and Eleanor Laser, *Patient Sedation Without Medication: Rapid Rapport and Quick Hypnotic Techniques* (Victoria, BC, Canada: Trafford Publishing, 2009).

^{iv} Elvira V. Lang, Cayte Ward, and Eleanor Laser, “Effect of Team Training on Patients’ Ability to Complete MRI Examinations,” *Academic Radiology* 17 (2010):18–23.

^v Albrecht H. K. Wobst, “Hypnosis and Surgery: Past, Present and Future,” *Anesthesia and Analgesia* 104 (2007): 1199-1208.

^{vi} James Esdaile, *Mesmerism in India and its Practical Application in Surgery and Medicine* (London: Longman, Brown, Green and Longmans, 1846).