

Flotation REST in Applied Psychophysiology Thomas H. Fine, M.A. and Roderick Borrie, Ph.D.

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Introduction

Restricted Environmental Stimulation Therapy (REST) has fascinated many researchers, clinicians, and explorers of consciousness, promising something special - a powerful transformation, a mystical peak experience, an intense change in biochemicals, improved performance, or a healing of our ills. Beyond the fascination, Flotation REST has established itself as a unique method in the field of applied psychophysiology. Flotation REST has proven to be a technique with predictable psychophysiological effects and powerful clinical and performance applications. This article will provide the reader with an introduction to the basic research into Flotation REST's psychophysiological effects, and a brief overview of the clinical and performance applications currently in use by REST clinicians and researchers. The article will examine in greater detail the use of Flotation REST as an intervention for chronic pain.

REST is an acronym for Restricted Environmental Stimulation Technique, a name developed in the late 1970s by Peter Suedfeld and Roderick Borrie for a technique that had previously been called Sensory Deprivation (SD) or Sensory Isolation. Since much of the early SD research had been misinterpreted, especially by writers of introductory psychology texts, a widely accepted myth developed that SD environments were highly stressful, even models for producing psychotic like

experiences. This led to difficulties with the Sensory Deprivation concept. Ultimately Suedfeld and Borrie proposed that, since the process involves restricting the environmental stimulation that the patient or subject experiences, REST would be a more accurate and less provocative acronym.

Flotation REST is a special type of REST popularized by John C. Lilly, M.D. Lilly developed an immersion system in the late 1950s that was used in early SD experiments. In the 1960s he developed a flotation system in which a person floats in a light free, sound reduced chamber in a highly concentrated solution of Epsom Salt and water maintained at a constant temperature of 94.5 F (Lilly, 1977, p. 118).

Both Wet and Dry REST systems have been utilized in research and practice. Wet-REST systems utilize flotation in salt water, and Dry-REST systems utilize a modified REST environment in which a pliable 15 mm. polymer membrane separated the floater from the fluid (Turner, Gerard, Hyland, Neilands, & Fine, 1993).

At the Medical College of Ohio, John Turner and I conducted a series of studies investigating the psychophysiological effects of brief sessions of Flotation REST. The REST environment used in all of these studies was a plastic or fiberglass chamber, approximately 1.1 m. x 1.3 m. x 2.5 m. filled to a 25 cm. depth with saturated epsom salts (Mg SO) solution having a specific gravity of 1.28 and temperature maintained at 34.5 C. The chamber was light-free and the sound level was less than 10 decibels, with further attenuation due to submersion of the ears in the solution. The general protocol consisted of 30-40 minute sessions repeated approximately every third day with a total number ranging from 4 to 20 sessions per study.

The first parameter we addressed was the subjective report of the REST experience. We utilized several indices of subjective reports including the Spielberger state anxiety scale, Zuckerman multiple affect adjective checklist (Turner & Fine, 1990a), profile of mood states (POMS) (Turner, Fine, Ewy, Sershon, & Frelich, 1989), and subjective rating scales of emotion and relaxation. All of the initial studies found marked pre-post and across-session changes indicating relaxation, an increase in positive emotion and a decrease in negative emotions. In addition, an analysis of well over 1,000 descriptions of the REST experience indicated that more than 90%

of subjects found REST deeply relaxing.

Psychophysiological Effects of Flotation Rest

In choosing physiological parameters of the REST effect on relaxation, we examined the basic physiological and biochemical hormonal changes associated with stress responding. Physiological parameters measured included blood pressure (BP), muscle tension (EMG), and heart rate (HR). Hormonal parameters included both adrenal axis hormones such as ACTH, epinephrine, norepinephrine, cortisol and aldosterone, and hormones not mediating stress responding (luteinizing hormone and testosterone). Both within and across-session decreases have been observed in various hormones. Hormones directly associated with the stress response. Cortisol, ACTH and epinephrine showed decreases during REST sessions, whereas luteinizing hormone, which is not associated with the stress response, showed no change (Turner & Fine 1983). Likewise, across-session decreases were observed in adrenal-associated hormones (cortisol, aldosterone, renin activity), while a hormone unrelated to stress response (testosterone) did not show across-session changes (Turner & Fine, 1990a). In a separate study, we examined the across-session effect on both mean cortisol values and their variability, observing a decrease in both parameters (Turner and Fine, 1991). This suggests the possibility of a resetting of the regulatory mechanism of cortisol across sessions. Furthermore, cortisol, which has received more attention than the other hormones, and Blood Pressure, have been shown to maintain the REST effect after cessation of repeated REST sessions (Turner & Fine, 1983). This phenomenon suggests that the REST effect may be more than a simple, immediately reversible response.

Interestingly, in comparing hormonal and BP changes in REST with these changes in another relaxation condition (biofeedback), REST consistently showed greater hormonal effects but similar BP effects to biofeedback assisted relaxation (McGrady, Turner, Fine, & Higgins. 1987). These results led us to consider that REST affects different mechanisms than the biofeedback (since it affected cortisol levels when other methods did not) or was simply more powerful (i.e. REST reached the threshold for cortisol change but biofeedback did not).

Clinical Applications of Flotation REST

These results provide strong support for the hypothesis that Flotation REST serves as a powerful relaxation inducer and has clinical potential in working with patients who have stress-related disorders. There have been several clinical studies that have employed REST as a treatment. The disorders treated include essential hypertension, muscle tension headache, anxiety disorders, chronic pain, psychophysiological insomnia, PMS, and rheumatoid arthritis (Fine and Turner, 1985; Rzewnicki, Alistair, Wallbaum, Steel, Suedfeld, 1990; Fine and Tumer, 1985; Goldstein and Jessen, 1990; Turner, DeLeon, Gibson, & Fine, 1993). The treatment paradigms used in these studies were similar, with REST serving as the primary method of relaxation induction and training. All of these studies demonstrated positive results from the use of REST. One of the unique effects of REST demonstrated in these studies was that chronic pain patients frequently experienced an absence of all pain during flotation, and that this spontaneous anesthesia could remain for up to several hours after the session. Unfortunately, as with many bio-behavioral treatment approaches, the large scale controlled trials have yet to be undertaken.

Flotation REST and Performance Enhancement

A separate, exciting area is the use of Flotation REST in the enhancement of human performance. Several studies, carried out primarily in the research programs of Peter Suedfeld at the University of British Columbia and Arreed Barabasz at Washington State University, have demonstrated enhancement of scientific creativity, instrument flight performance, and piano performance. Several studies of sports performance have had positive results including studies of basketball, tennis, skiing, rifle marksmanship, and dart throwing. In several of the studies the Flotation REST condition was varied with relaxation, or imagery training and always had a more powerful effect. Often, Flotation REST was used with imagery or without imagery, and no difference was found. Flotation REST, either wet or dry, was sufficiently powerful to affect a change in performance. Barabasz suggests that because REST potentiates imagery while disrupting over learned psychological processes, the technique is especially suited not only for the acquisition of new improved skills but

the unlearning of less adaptive ones.

Flotation Rest and Pain Management

An in depth examination of the role of Flotation REST in the management of pain can provide us with a clear picture of the psychophysiological nature of the treatment. Pain programs are generally used as a last referral resort for patients whose intractable pain has not responded to the traditional medical treatments. Biobehaviorally based pain management utilizes counseling and behavioral medicine techniques such as relaxation training, meditation, biofeedback, guided imagery, and self-hypnosis. The goals of such treatment are the development of pain avoidance skills, the establishment of routines for optimal fitness within the limitations of a disability, the reduction or elimination of pain, when possible, and/or the patients acceptance of some level of pain.

Flotation REST can have an important role at several stages of the pain management process. By reducing both muscle tension and pain in a relatively short time and without effort on the part of the patient, flotation provides a dramatic demonstration of the benefits of relaxation. Relief is immediate and, although temporary, offers promise of further relief from REST and other relaxation-based strategies. Symptom reduction gained from flotation can increase a patient's motivation and interest in the remainder of the therapy plan. Pain patients generally come into treatment feeling suspicious and skeptical, requiring a clear demonstration that they can be helped. Flotation can be the vehicle for that demonstration.

The relaxation following flotation can be used to facilitate relaxation training. In the treatment reported here, training in relaxation and other psychological pain control strategies occurred during the flotation REST sessions as well as in counseling sessions. Specially prepared audio programs introduced patients to breathing techniques, progressive muscle relaxation, autogenic training, guided imagery and hypnotic suggestions for pain reduction while they floated. Training and practice in those same techniques followed in counseling sessions and at home.

The most common etiologies of pain in this group of patients were from motor

vehicle accidents, work accidents, or chronic illness. Most had endured their pain for longer than six months and had also suffered various levels of anxiety, anger, and depression. These emotional problems must be considered in the treatment of chronic pain patients. The first data are pre-post pain ratings from 16 patients who floated from one to 16 flotation sessions. Each patient reported on up to four body areas, providing a total of 253 pre-post , measures. The average percentage of relief, as measured in decrease from the pre-session value, was 31.3% for all sessions and all measures. To determine whether flotation REST provides more pain relief to some parts of the body as opposed to others, these measurements were examined by body area. Pain reduction in most body areas was close to the overall mean of 31%, except the upper back, which showed a 63.6% pain reduction, the arms which showed a 48.2% reduction, and the legs, which showed a 15.3% pain reduction. The duration of relief varied from two hours to seven days.

A second set of data came from a survey mailed to patients who had completed the program. The questionnaire asked patients to assess how much pain relief they received from the various components of the pain program (Flotation, relaxation training, and counseling) and from other treatments they had received medication (pills and shots), physical therapy, chiropractic, and surgery. Short-term pain relief, long-term pain relief, relief from anxiety or stress, and relief from depression were indicated separately. Additionally, they were asked whether each treatment improved their outlook and/or helped them cope with their pain.

All 27 respondents had received treatments other than those from this pain program: 81% had used pain medications; 56% had had some form of pain injections; 70% had received physical therapy; 59% had received chiropractic treatment; 22% had undergone surgery. These patients reported more short-term and long-term pain relief from flotation than from the other therapeutic modalities.

For non-pain symptoms, the comparisons were even more striking. Patients reported far more relief from anxiety and stress from flotation than any other modality. For depression, flotation was equal to counseling at near 70%, with relaxation training at 53% and physical therapy and medication at 20%. Patients also claimed to have reaped a variety of other benefits from flotation, reporting improvements in sleep

(65%), mental concentration (77%), energy (46%), interpersonal relationships (54%), ability to work (35%), ability to cope with pain (88%), ability to cope with stress (92%), and feelings of well-being (65%) resulting from flotation REST.

In answering the question, "Did this treatment improve your outlook toward your pain?" 96% responded positively for flotation, 100% for counseling, 100% for relaxation training, 50% for physical therapy, 24% for pain pills, 17% for pain shots, 15% for chiropractic. To the question, "Did this treatment help you cope effectively with your pain?" 96% responded positively for flotation, 92% for both relaxation training and counseling, 50% for pain shots, 44% for pain injections, 38% for physical therapy, and 17% for chiropractic. It is clear that flotation was rated on average as more effective than other treatments with respect to pain, anxiety and depression relief.

Flotation REST and Chronic Illness

Summing up thus far, the data are supportive of flotation REST being useful in pain reduction, stress and tension abatement, and mood enhancement. Besides chronic pain, other patients treated at our facility were those with chronic physical illnesses, those with cancer, those with trauma to the nervous system, those with depression or bipolar mood disorder, anxiety disorders, and those suffering overwhelming stress.

Uniquely, Flotation REST provides an effortless introduction to deep mental and physical relaxation. The majority of our chronic illness patients suffered from autoimmune diseases, including rheumatoid arthritis, lupus, scleroderma, and Reiters syndrome. For these patients, discovering relaxation meant a dramatic reduction in symptoms, such as joint pain, headache, fatigue and depression. Several patients with lupus reported that regular flotation permitted them to reduce their dosage of prednisone while experiencing less frequency and severity of symptoms. Two patients with scleroderma reported relief from flotation. One reported relief from pain and stiffness that lasted almost a week after her third flotation session. As this patient continued she also experienced relief from her depression about the illness, a dramatic reduction in her use of steroids and other medications,

a reduction in joint pain and swelling, and less frequent heartburn and headaches. After a three month course of treatment with flotation and counseling she was able to return to her job.

Flotation REST and Depression

When depression is in reaction to the circumstances of a physical injury or illness, Flotation REST can produce an immediate elevation in mood, probably due to the mood enhancing effects of deep relaxation as well as the optimism that occurs with the experience of physical relief. When depression is the primary diagnosis, flotation is best used as an adjunct to counseling and then only after the patient has gained a modicum of feeling in control. Caution is necessary in administering REST with depressed patients due to the often obsessive nature of negative thinking that will continue during the REST session. Once these patients have developed a better understanding of their disorder, flotation REST can be a mood elevator that speeds the course of therapy, especially when combined with positive guided imagery during the sessions.

REST and Applied Psychophysiology

The REST environment can be viewed, from a biofeedback perspective, as a system that enhances the connection between consciousness and physiology by reducing external information rather than amplifying internal information. We describe biofeedback as a process of amplifying and displaying information about processes that we normally do not attend to or are unable to discriminate from the wealth of informational noise always present. REST reduces environmental noise, and in a flotation environment one is able to be aware of all sorts of physiological information, (i.e. muscle tension, heart rate, etc.) that we are often not aware of in normal quiet environments.

REST is an ideal environment for the acquisition of biofeedback based learning. Many years ago Lloyd and Shurley published a paper demonstrating its effect on the acquisition of single motor unit control. Acquisition of single motor unit control was superior in the REST chamber (Lloyd & Shurley, 1976). Our investigations found the

same advantage with heart rate control. Similarly Dry-REST environments might be exceptional environments for neurofeedback training. While we have learned much about REST in the last twenty years, its potential in applied psychophysiology has barely been exploited. In this age of cyberspeak, we might begin to think of expanding the clinical bandwidth of applied psychophysiology by taking another look at REST.

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