

HEALTH AND STRESS

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MASSAGING STRESS AWAY

KEY WORDS: massage techniques and devices, autogenic training, Johannes Schultz, progressive muscular relaxation, Edmund Jacobson, somatopsychic and subtle energy medicine

Massage is probably one of the oldest and most effective stress reduction techniques. Evidence from ancient illustrations and folklore references indicate that massage was practiced in some structured fashion more than 5000 years ago, both in the Orient and Mesopotamia. Acupressure, or *tien'an* was an integral part of ancient Chinese medicine, and was used like acupuncture to improve the flow of *Qi* energy through the body. Our oldest written records date back to 500 B. C., when a form of finger and knuckle pressure known as *shiatsu* was popular during the Yellow Emperor's dynasty. Around the same time, Hippocrates, often referred to as "The Father of Medicine", wrote that the best way to relieve tension and promote health was "a scented bath and an oiled massage every day".

The derivation of massage is usually attributed to *amassar*, a Portuguese verb used to describe the kneading of *massa* (dough). However, it is more likely that it comes from *mass*, an Arabic word meaning to touch, and especially to palpate.

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Both early Chinese and Greek medicine had a holistic approach to health that emphasized the inseparability of mind and body. As summarized by the Roman poet Juvenal 2000 years ago, good health consisted of "*mens sana in copore sano*", (a sane mind in a sound body). This appreciation of the strong interrelationships between mind and body prevailed until Western medicine came under the influence of the 17th Century French philosopher and mathematician, René Descartes. In his view, the body was nothing more than an intricate mechanical device, and all illness was due to some breakdown in its complex machinery. The mind and emotions had nothing to do with disease, were beyond man's comprehension, and more properly the province of priests, rather than physicians.

This attitude persisted well into the present century, until psychosomatic medicine pioneers showed how emotional stress could cause headache and low back pain due to increased muscle spasm, and contribute to other disorders. Recent advances confirming the crucial role stress can play in cardiovascular disease and immune system disturbances have further demonstrated the importance of mind-body relationships.

However, the reverse is also true. Massage can exert beneficial influences on cardiovascular and immune system function, and even our emotional responses to stress. Some background information may be helpful to appreciate these and its many other psychophysiologic rewards.

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Paul J. Rosch, M.D., F.A.C.P.

Editor-in-Chief

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Somatopsychic Medicine

Doctors have not devoted as much attention to body-mind, or "somatopsychic" relationships. Most of the interest in this area has come from physical therapists, chiropractors, and practitioners of various "bodywork" practices, such as Rolfing, reflexology, and the Alexander Technique. Pain and disability due to muscle spasm and arthritis can clearly have a negative impact on our mood and behavior. Alleviating these complaints by any of the above approaches or medication would obviously help to lower stress levels.

But what about individuals without physical symptoms, who are depressed, worried, anxious, or tense? It is quite clear that reducing stress can relax tense muscles. What is not adequately appreciated is that, here again, the reverse is also true. Muscular relaxation, and even physical touch can provide powerful stress reduction rewards, as well as other surprising health benefits.

Anecdotal reports of this have existed since antiquity. However, scientific proof came earlier in this century by two separate and serendipitous observations. One was by a German neurologist interested in hypnosis, and the other from a physician in Boston, who was studying responses to the stress of being startled by a sudden and loud noise.

The Autogenic Training Switch Point

The German neurologist was Johannes Schultz, who was investigating hypnosis, and in particular, the mechanisms that were responsible for inducing the hypnotic state. He was impressed with the observation that many of his patients spontaneously reported sensations of heaviness and warmth in their arms and legs just before they went into a trance. He suspected that this might be an important physiologic "switching point", since he had never mentioned anything resembling this as part of his procedure. In addition, when he subsequently suggested such feelings in other patients, he found that they were much easier to hypnotize.

Schultz reasoned that these feelings of heaviness and warmth resulted from an increase in the amount of blood in the extremities. This would most likely be due to dilation of the arteries, which meant that there must have been a significant relaxation of the smooth muscle in the walls of these vessels. Simultaneous relaxation of the large skeletal muscles in the arms and legs would have also increased the volume of blood they could contain. This would account for both the sensation of heat and heaviness that had been experienced.

Schultz was a firm believer in natural healing powers, and suspected that if patients could convince themselves that their arms and legs were heavy and warm, they might achieve a state of deep relaxation similar to that seen during hypnosis. He began to develop a series of "autogenic" training exercises, in which patients were encouraged to visualize the feelings of warmth and heaviness in their extremities by mental imagery strategies, while simultaneously repeating to themselves certain suggestive phrases. To his delight, he found that this was indeed able to induce both deep mental and physical relaxation in many individuals. Since warm baths and/or cool compresses applied to the forehead often had a calming effect on agitated patients, Schultz subsequently added instructions designed to promote feelings of warmth in the abdomen and coolness on the forehead. Over 2,000 scientific studies have now confirmed the efficacy of autogenic training. It is the most popular form of self-administered stress reduction therapy in Europe, if not the world. *(Continued on page 3)*

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The Muscle-Mind Connection

But what was the mechanism responsible for this? How could it be investigated? Jacobson was frustrated by the inability to accurately assess the degree of muscle tension. However, since this could be correlated with the magnitude of electrical activity in muscle, he decided to pursue this approach. The problem was that these electrical forces were extremely weak, and barely detectable with conventional instruments. With the assistance of scientists at Bell Telephone Laboratories, he developed a device that could detect and measure minute action potentials from muscle groups at levels as low as one microvolt. It became the prototype of instruments that are currently used to diagnose various muscle and nerve disorders, and for electromyography (EMG) biofeedback.

He discovered that as the muscles in the arms and legs started to contract, special receptors embedded in them became progressively stimulated, and started to send signals to the brain reflecting this changing degree of tightening. The initial perception of this increased tension was called "the control signal", since it appeared to be responsible for alerting the brain to stimulate other muscles and responses that might be purposeful for a particular situation. Jacobson reasoned that if skeletal muscles could be sufficiently relaxed to prevent any generation of this signal, then the resultant reduction in nervous system activities would lower the tension in muscle groups elsewhere in the body, and also induce mental relaxation.

His initial experiments confirmed that this was true, but only in a very few subjects who somehow were able to deeply relax a sufficient number of different muscle groups. Once they had become proficient in this, there appeared to be numerous potential clinical applications, ranging from a reduction in blood pressure, to relieving swallowing difficulties due to increased tension in esophageal muscles. They also reported feeling much calmer and more emotionally relaxed. Those who were particularly adept at quickly inducing muscle relaxation, found it to be a very effective way to rapidly relieve annoying physical and mental symptoms that were stress related.

Most individuals were unable to achieve these results. It was difficult to simultaneously relax multiple muscle groups in different parts of the body. And even if they focused on just one muscle, it was hard to detect subtle states of tension, or to know exactly when sufficient relaxation had been attained, and was being successfully maintained.

How could patients be taught to develop such skills? One way might be to hook them up with his sensitive electrical measurement equipment. This would display the degree of tension, and identify when the control signal was no longer present, thus indicating that a state of sufficient relaxation had been reached. This is essentially what EMG biofeedback consists of. However, such an approach would be extremely expensive and time consuming, since it would have to be supervised on an individual basis. To avoid this, Jacobson devised a procedure designed to help patients become aware of the internal signals reflecting the degree of tension for a particular muscle group.

It consisted of systematically tensing and then relaxing one muscle group until its control signal for tension could be readily recognized, and then moving on to another. This was much easier to accomplish in some areas of the body than others. The control signal from the large muscles of the arms and legs could often be as obvious as a loud noise. In contrast, the tiny muscles of the tongue and eyes generated tension signals perhaps one thousandth the magnitude of this force, and were much more difficult to detect.

In EMG biofeedback, small sensors relay the electrical activity of a muscle to a device which converts it to an audible tone or visual display that varies with its intensity. Since this changing signal also reflects the degree of muscle tension, patients can monitor their progress in achieving deep relaxation by variations in the volume or pitch of the tone, or corresponding changes in a meter or L.E.D. readout. Jacobson's procedure teaches them how to become familiar with feelings that reflect relaxation in a specific muscle group. It represents a form of internal biofeedback, in which muscle tension signals are identified internally, rather than through external visual and auditory cues.

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To achieve maximal relaxation, Jacobson made his patients lie down and practice for hours, until the control signal could be identified at least three times for each of the muscle groups in both arms and legs, the trunk, neck, face, eyes, and skull. One muscle group was then exercised daily until the absence of its control signal could be quickly and consistently achieved, signifying deep relaxation. This usually took a week or longer, and was then repeated for each of the other groups until all had been mastered. The identical procedure had to be subsequently completed all over again in the same order, but now in a sitting position. This entire process took months to complete, and achieving total relaxation often required years of intensive daily practice.

It is important to emphasize that patients were carefully instructed to never actively attempt to relax their muscles, since this would require a conscious effort. His sensitive measurement instruments had shown that in relaxed subjects, even thinking about moving a limb produced tiny electrical and muscle activity that was completely undetectable by the patient or anyone else. In fact, any thought usually resulted in some evidence of muscle activation, especially if it involved the mouth or eye. Conversely, he found that there were also unsuspected muscle-mind connections which had even more important clinical implications, especially in regard to stress reduction.

This powerful effect of deep muscle relaxation on the mind was not appreciated, until patients practicing progressive muscular relaxation reported that they were often completely unaware that they had arms or legs. Since completely relaxed muscles do not generate any control signals, the brain has no information as to where the extremity is in space, or even if it exists. Theoretically, if all the muscles of the body could be totally relaxed, one would be unaware of anything. Indeed, subjects who had mastered all the exercises insisted that they sometimes felt completely paralyzed or unconscious, and unable to remember any thoughts during this period. Massage is not likely to achieve this state of suspended animation. However, it can relax taut muscles, and has additional attributes that provide significant stress reduction benefits.

Muscles And Massage

The musculoskeletal system is the only system in the body over which we have direct control. Skeletal muscles are referred to as voluntary muscles, because they allow us to control such activities as walking, chewing, and lifting. There are over 1000 skeletal, or striated muscles in the body, the latter term referring to the fact that under the microscope, they have striae, or stripes. Non-striated, or smooth muscles, which are found in the walls of blood vessels and the gastrointestinal tract, are generally considered as not being under our conscious control. Their activity is regulated by the autonomic or involuntary nervous system. However, they are stimulated to contract when there is a significant increase in skeletal muscle tension. This would obviously result in an increase in blood pressure and gastrointestinal activity.

It seems reasonable to assume that relaxation of skeletal muscles might have the reverse effect, and favor the restoration of normal cardiovascular and gastrointestinal function. As noted, significant skeletal muscle relaxation is accompanied by a corresponding degree of mental relaxation, which would also help. Stress stimulates nervous system activities and the release of hormones that cause smooth muscle to contract, and muscle relaxation helps prevent this. Thus, massage induced muscle relaxation could help to reduce increased blood pressure or gastrointestinal spasm and motility problems by multiple mechanisms.

Massage can provide other stress reduction rewards for patients with anorexia, who, although painfully thin, continue on starvation diets because they persistently perceive themselves as being too fat. One study of young women with anorexia showed that their body image assessment improved significantly, along with a marked reduction in levels of depression and anxiety, after receiving massages just twice a week for five weeks. Massage may have been one of the few times that they ever experienced or viewed their bodies as a source of pleasure. Negative thoughts about how they appeared to others were quite likely replaced by the soothing sensations induced by the therapist, and the feeling that someone was devoting caring attention to their bodies.

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Most of the studies on massage have concentrated on its direct physical effects. However, many of these are also helpful in alleviating conditions or disorders that cause stress. Massage can provide quick and effective relief of pain, discomfort, and limitation of motion due to arthritis or traumatic injury, and may be of particular value to athletes. "Sports massage" concentrates on parts of the body that are particularly affected by certain activities, such as the legs in runners, and the arms of swimmers. Increased heat and pressure from the therapist's hands can cause the release of histamine, which dilates blood vessels, and the increase in circulation would allow muscles to receive more oxygen and nutrients, and get rid of lactic acid and metabolic waste products. That is why boxers' arms and legs are massaged between rounds. Massaging the legs prior to races might provide similar benefits by making muscles more supple, and also reduce the stress associated with fierce competition, and is being tried in college track teams.

In addition to improving blood circulation, massage increases the flow of lymph. This milky white fluid carries waste products and impurities away from tissues through channels that pass through gland-like structures that act as sieves, or filtering valves. Malignant and infected cells often spread through the body through the lymphatic system, causing enlargement of these lymph nodes. Unlike blood, lymph does not circulate swiftly, because it is not propelled by cardiac contractions, but rather the squeezing effect of muscle contraction. The circulation of lymph tends to be sluggish in people who are inactive. On the other hand, although it speeds up during exercise, the resultant increased production of metabolic waste products may negate any benefits, and result in an overall reduction in the ability of lymph to cleanse tissues. In both situations, massage can dramatically increase the flow of lymph to promote purifications.

These and other attributes explain why massage can benefit patients with hypertension, headache, insomnia, anxiety, depression, and pain due to muscle spasm. As will be seen, it is particularly effective in relieving low back pain and other symptoms stemming from occupational pressures.

Massaging Away Job Stress

Lower back complaints are a routine occupational hazard in the shipping industry. One company, where workers had to manually lift about two tons of heavy boxes of paper daily, averaged 8 lower back pain injury cases a year. The price tag for this was several hundred thousand dollars and the loss of well over 200 workdays. Ergonomic improvements had little effect, so they hired a massage therapist to come in once a week for three hours to provide treatment to anyone who wanted it.

The technique used was a form of Swedish massage, but with emphasis on trigger point therapy, if specific sites causing pain were found. In some cases, muscle spasm knots that had been causing intermittent but severe distress for years, were completely abolished. Initially, only a few workers signed up, but after a few months, word got around about their obvious and impressive improvement. The service had to keep expanding to accommodate everyone, and within 18 months, the number of days lost to back injury had fallen to zero! Therapists now also pay regular visits to office workers in skyscrapers, as well as laborers in factories. Merrill Lynch and other large firms now have full time massage therapists on staff at their corporate headquarters.

Massage is also coming to the masses. An entrepreneur jogging through San Francisco's Golden Gate Park, noticed people lined up before a dirty, homeless looking man, who was charging \$1.00 a minute for a massage. He subsequently discovered an array of massage devices in various catalogues, and hit on the idea of combining these services in a chain of stores that could offer fast, convenient massages, and massage products, to fully clothed clients. The first Great American BackRub store opened in Manhattan in 1993, and was quickly followed by another 15 in New York City, Chicago and Denver. Last year, \$6.2 million was raised, and forty more branches are set to open in eight new markets. Their licenced masseurs are specially trained to insure standardize treatments ranging from \$14.95 for 10 minutes, to \$49.95 for a 45 minute session. Facilities are also popping up in major airports and malls for tired travelers and stressed out shoppers.

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Swedish Massage

Most modern massage services are modifications of a method developed in the last century by a Swede named Per Henrik Ling. He was so impressed by the results he had observed during a visit to China, that he incorporated these ancient oriental skills into his own technique. This had five components that consisted of stroking, kneading, pressing, vibrating, and tapping various parts of the body, using the palms, fingers, or sides of the hand in a prescribed and orderly fashion.

After relaxation therapy and chiropractic, Swedish massage is the third most common alternative treatment in the U.S., and has been the subject of extensive scientific research. In one report, it was found to reduce anxiety and stress-hormone levels much better than a muscle relaxation procedure. The resultant relief also improved sleeping habits. In addition, instead of causing drowsiness, it increased alertness, as measured both by brain wave changes, and the ability to perform mathematical calculations. A similar state of heightened awareness associated with deep relaxation is also often reported during deep meditation.

In another study, fibromyalgia patients received daily massage, conventional treatment with transcutaneous nerve stimulation (TENS), or a sham TENS procedure as a placebo. After five weeks, the massage group reported significantly less pain, stiffness, anxiety, depression, insomnia, and fatigue than any of the other groups. Regular massage can provide impressive benefits for some patients with chronic headaches and asthma.

Massage has also been shown to stimulate the immune system's production of antibodies to fight different diseases, and to increase the number and efficiency of natural killer cells, which defend against infections and cancer. The Government has awarded more grants to study massage than any other alternative therapy. However, there is wide variation in the duration, order, and inclusion of various components, and especially individual skills and techniques. This lack of uniformity and difficulty in standardization makes it hazardous to extrapolate the results from one treatment type, to all the others that may be offered under the same name.

Other Types Of Massage

Americans are estimated to spend up to \$4 billion annually for massages in resort spas, backrub outlets, workplaces, therapists' offices, and at home. Massage parlors that front for prostitution have given the profession a bad reputation. Sexual massage ads in the yellow pages of some parts of the country often drown out the few legitimate listings, but things are changing. Certain insurance plans now cover massage, and over the past 5 years, membership in the two largest professional associations has more than doubled to 40,000.

There has also been a proliferation of different terms, titles and systems of massage, such as therapeutic, holistic, body work, Oriental, Esalen, Reichian, reflexology, etc. There are over 80 different types of techniques, ranging from vigorous approaches like Rolfing, to polarity and touch therapies that allegedly manipulate the body's energy field. A sampling of some of these might include:

- Acupressure, an ancient Chinese practice which is based on the same concepts of acupoints and meridians as acupuncture, but uses finger pressure instead of needles to unblock or balance the flow of *Qi* energy in the body.
- Shiatsu, a Japanese variation of acupressure that incorporates manipulation and other elements of physiotherapy and osteopathy.
- Reflexology, a specialized form of foot massage, based on the theory that the body is divided into ten equal zones that extend from the head to the toe. Stimulation of a specific site in the foot of one zone is said to energize other parts of the body in the same zone, such as the ball of the foot and the thyroid.
- Therapeutic massage, which consists primarily of soothing strokes and gentle rubbing designed to provide comfort. A recent study reported that this can speed up recovery following a heart attack.
- Biodynamic massage, a combination of massage and exercise designed to release emotional tension based on Wilhelm Reich's bioenergetic theory of energy flow in the body. Patients are taught to "connect with" this flow in much the same way as they would experience an orgasm.

Many other approaches are based on equally exotic concepts, and there are also numerous "do it yourself" devices. *(Continued on page 8)*

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Electrostatic massage is based on the premise that the abnormal flow of electrons in an injured area can be corrected by passing a piece of ordinary PVC pipe charged with static electricity back and forth over the affected site. This is done at a distance of 1/4 to 1/2 inches from the skin for 15 minutes, or until symptoms improve. The physician who developed it reports short term success in 75 to 92% of 236 patients with pain due to arthritis, fibromyalgia, rotator cuff tendinitis, and various types of headache. The electrostatic charge on the pipe can be readily replenished by rubbing it briskly with a cloth.

The popularity of massage has spawned a plethora of products that can be self-administered to massage any part of the body from head to toe. Upscale catalogues offer devices such as the *Skalpi* massager for the skull (\$59.95), the *Embracer Cervical Neck Massager* (\$99), the *Real-Ease Neck and Shoulder Relaxer* (\$35), the *Relaxor Personal*, an electrically powered full-length mat that has controls for speed and five body "zones" from the upper back to the lower leg (\$199), the *Pedispa*, a whirlpool foot bath (\$124), the *Accuvibe* foot massager to provide reflexology rewards (\$299), etc. Particularly popular are gadgets designed to deliver a shiatsu type neck massage, that vary in force and price (\$29.00 to \$139). With a willing partner, you can even obtain many of the benefits of a professional massage, as noted below.



The (M.A.T.TM) system shown on the left includes a special body positioning mat, instructional video, and massage oils. It provides everything necessary for teaching someone which muscles to massage, and what techniques to use to relieve stiffness and pain. The mat lets you lie face down and breathe normally without twisting your head to one side, and also provides a pelvic tilt feature to reduce stress on the lower vertebrae. This obviates the need to purchase an expensive professional massage table, and allows you to receive a massage at your convenience, at home or in the office, and at a fraction of the cost, since systems start at \$89.95.

Licensure and certification requirements vary from state to state, but details about this and a listing of certified massage therapists in your area can be obtained from the National Certification Board for Therapeutic Massage & Bodywork (800-296-0664, and www.ncbtmb.com), the American Massage Therapy Association (847-864-0123), and the International Massage Association (800-933-7113).

Further research on the psychophysiologic effects of massage may provide additional insights into the mechanisms and potential power of this and other subtle energy medicine approaches.

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Editor-in-Chief

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