Techniques in Orthopaedics®
18(1):94–109 © 2003 Lippincott Williams & Wilkins, Inc., Philadelphia

The Application of Therapeutic Massage for Low Back Pain

Linda Derick, M.A., L.M.T., Robert Pecora, L.M.T., Synthia Ramsby–Andrews, B.A., L.M.T., and Matthew Schrier, M.S., D.C.

Summary: The incidence of low back pain in the United States continues to increase, with four out of five adults experiencing low back pain in their lifetime. This poses a substantial cost to consumers and insurers alike. With more people seeking complementary alternative medicine as a means to a cost-effective treatment, the scientific community is seeking to study the efficacy of these treatments. Approximately $21.2 billion was spent on complementary alternative medicine therapies in 1997. Massage therapy is rapidly becoming a notable part of the complementary approach continuum. To recognize the contribution of massage therapy, a deeper understanding of its approaches and limitations must be clearly delineated. Research into therapeutic massage is limited by lack of a uniform definition of low back pain, lack of a uniform definition of what constitutes massage therapy, difficulty in blinding studies, and variable outcome measures. Despite these research limitations, those studies that have been completed have supported the safe and effective application of massage modalities. To initiate the interface between allopathic physicians and massage therapists, an understanding of the scope of practice, components of safe practice, general precautions and contraindications, and massage techniques with associated benefits must be described thoroughly. To provide a clear example of the application of massage to low back pain, one protocol has been selected as representative. A working relationship between the physician and the massage therapist is good for their patients/clients, which in turn is good medicine for the changing trends in health care provision. **Key Words:** CAM—Client assessment—Compression—Massage—Low back pain.

Americans are experiencing an epidemic occurrence of low back pain. The American Academy of Orthopaedic Surgeons identifies low back pain as one of the most frequent problems treated by orthopaedic surgeons: "Four out of five adults will experience significant low back pain sometime during their life. After the common cold, problems caused by the lower back are the most frequent cause of lost work days in adults under the age of 45."[21] The cost, to all of us, is staggering. American industry loses billions in productivity, and consumers and insurers pay billions more for treatment.

Chronic pain and low back pain are the two most common conditions bringing people to massage therapy. Many people use complementary alternative medicine (CAM) in addition to standard medical care as a cost-effective, largely noninvasive treatment that has few negative side effects and is often a pleasurable option in the treatment, management, and prevention of low back pain. Although we are currently in the early professional stages of integrating massage with the current range of orthopaedic treatment options for chronic low back pain, there is much evidence that it is happening and is likely to progress.

A research survey conducted by Eisenberg et al.[9] revealed that in 1990 the public made an estimated 425 million visits to providers of unconventional therapy, spending an astounding $13.7 billion. The majority of visits were for chronic, as opposed to life-threatening. conditions. A follow-up study conducted in 1997 showed a 47.3% increase in the total number of annual visits to CAM providers, with $21.2 billion being spent. Therapies that showed the greatest increase included therapeutic massage.[9] In 1990, approximately 64% of the money spent on CAM was paid out of pocket.

An alarming finding of these studies was the revela-

From the CT Center for Massage Therapy, Newington, Connecticut, USA.

Address correspondence to Linda Derick, Director of Education and Program Development, CT Center for Massage Therapy, 75 Kitts Lane, Newington, CT 06111 USA; e-mail: linda@ccmt.com

tion that the majority of people receiving CAM treatments were not informing their primary care or specialist medical doctors. Feedback suggests that patients feared lack of support by their doctors in their choice to use CAM. Canadian research indicates that doctors do not refer patients to CAM providers because of a lack of knowledge and a fear of interfering with conventional treatments.[11] As massage therapy emerges as one of the fastest growing CAM modalities, information, education, and research into the benefits and contraindications for specific conditions is essential to support the coordination of massage with conventional medical treatment.

This article will familiarize the reader with the current field of massage therapy. We discuss the professional regulation and scope of practice of this evolving field. We provide a summary of current research about massage and low back pain, then focus on principles of assessment and definitions, and effects and contraindications of some of the many techniques that comprise therapeutic massage. A specific technique protocol for low back pain follows. Lastly we look at the medical massage therapy program, which is a collaborative effort between the Connecticut Center for Massage Therapy and Hartford Hospital in the Hartford, CT, area, where massage therapy students are interning in several areas of the acute care medical setting including orthopaedics.

The therapeutic massage described in this article, as indicated for the relief of low back pain, is an amalgam of many types of body work. In the orthopaedic context, it can be used to treat the soft tissues of the body, enhance circulation, decrease pain, and increase range of motion and balance by releasing the restrictions to allow greater freedom of structural movement, which can promote better quality of life. Massage treatment may be offered in a variety of environments including an acute medical setting such as a hospital, a subacute outpatient rehabilitation facility, or in the therapist's own home with a physician's referral or a patient's own request. Massage therapy can be preventative. It can provide treatment for the symptoms related to soft-tissue dysfunction. It can contribute to the maintenance of high-level wellness.

> *Vis medicatrix naturae*—helping the body heal itself—is the philosophy underpinning massage as therapy. . . . Mechanisms relied on to describe the effects of massage on the body are categorized as mechanical, physiological, reflex, mind–body, and energetic. *Mechanical mechanisms* occur at the gross level of the body's physical structure and result from compression, broadening, and stretching of the tissues. *Physiological mechanisms* are changes at the organ system, tissue, or cellular level. Changes in immune function can be an outcome attributed to the physiological mechanisms of massage. *Reflex mechanisms* occur when pressure or movement in one part of the body affects another body part. *Mind–body mechanisms* are the effects of mind and emotion on immunity, physiology, or disease process. A reduction in anxiety or depression as a result of massage, demonstrating changes in stress hormones, would be an example of a massage mind–body mechanism at work. Finally, *energetic mechanisms* are changes in the body's flow of energy, or a change in the life force. Energetic mechanisms are often compared with the meridian system, acupuncture points, and the flow of life energy, or chi.[12]

Massage therapy can affect chronic back pain mechanically by addressing soft-tissue structural dysfunction. The therapist may administer the techniques with the intention of directly impacting certain soft tissues in a mechanical way. Massage techniques may be applied directly to the hypertonic muscles that are contributing to low back pain with the intention of decreasing pain, and increasing range of motion and structural balance.

No less important is the systematic relaxation effect that massage induces, which, via the mind–body mechanism, contributes to primary and secondary healing/treatment effects. The pressure stimulation associated with touch increases vagal activity, which in turn decreases physiologic arousal and stress hormones while increasing serotonin levels, resulting in reduced pain levels. The relaxation effect of massage may at times be the primary soft-tissue treatment, while benefiting, secondarily, other bodily (as well as mental, emotional, and spiritual) functions.[12]

> Touch is the *sine qua non* of Massage and Bodywork Therapies. It is defined as *intentional* in contrast to casual or occupational. The character of this touch, say practitioners, is what makes or breaks the therapeutic encounter. Good touch is rewarding to patients; it is also rewarding to practitioners. Touch is powerful: it activates the deepest recesses of being and can have profound healing (or harming) effects. Touch can perform structural tasks, it can perform emotional, energetic and spiritual tasks. In the latter case it can help people become more attuned to their bodies, "feel" them better, thus be in a better position both physically and intellectually to make changes, such as to stop addictive or harmful habitual behaviors. Touch raises conscious-

> ness. This kind of touch is *skilled*; there is no accident about the benefits that accrue to patients.[1]

There is medical validity to the healing potential of intentional touch. Although one could identify ample justification for this statement, based on both personal and professional clinical experiences and observation, there has thus far been minimal scientific testing of it. Many factors are contributing to the increasing interaction of massage therapy (and CAM in general) and the orthopaedic medical model (biomedicine in general). Likewise, many factors are contributing to the lack of research studies. Many Americans who experience low back pain are trying to integrate their orthopaedic care with massage therapy. We hope that interprofessional information sharing and an aggressive research agenda can provide support.

THERAPEUTIC MASSAGE AND LOW BACK PAIN RESEARCH

Background

Properly conducted research educates health care providers about treatment options for their patients and opens the door for patients to receive care that may dramatically improve the quality of their lives. Research into the efficacy of massage for the treatment of low back pain is still scant. The very nature of massage therapy challenges the existing paradigmatic assumptions and standards that qualify contemporary research. In contrast to the reductionist paradigm inherent to the biomedical model, massage therapy is embedded within the paradigm of holism, wherein the intent is to treat the whole person, body, mind, and spirit. This implies certain attitudinal factors that are core to the effectiveness of massage treatment.

> Scientific method demands that bias be controlled and minimized to ensure that the data produced is as accurate and credible as possible. . . . In the practice of scientific research, the helping function of health care has sometimes been factored out of research designs. In the design of Massage and Bodywork Therapy (MBT), the skill of touching that is developed by the professional practitioner has sometimes been factored out of the research design. These are errors of model fit that could not have occurred had researchers paid sufficient attention to identifying assumptive patterns and to factoring these in to the research design. . . . Errors of model fit are common in cross-cultural or cross-paradigmatic research. MBT practitioners are involved in that kind of research because, for better or worse, the profession is socioculturally defined as "alternative." . . . Scientific knowledge is relative; [all] knowledge is constructed. Indeed, the implication of the concept of culture is that one's reality is constructed. . . . Each set of assumptions yields a somewhat (or markedly) different set of logical strings and fuels different behaviors; and each set is a construct that represents a selection from all possible assumptions and behaviors. Our way, whatever it may be, is not the way, but is simply one way among many, a model of reality. In short, science deals in models (not in truths). . . . Here are some further implications:
>
> - If an assumption changes, the subsequent logic, design and data will also change.
> - Since it represents a selection from all possibilities, one person's or occupation's model may not make sense to another, or may not suit another.
> - If a model can be constructed, it can also be deconstructed.
>
> The bottom line in this discussion is this: MBT researchers must pay special attention to ensuring that the unique character of MBT is secured within each and every research design so that these designs achieve high model fit validity. Assuming that the research is otherwise well-designed, this will in turn ensure that the resulting data accurately reflect the capabilities of MBT. To the extent that MBT is an holistic practice rather than a reductionistic one, it must accept biomedically promoted designs with care and attention to their actual utility for MBT.[1]

The work ahead of us is to create research studies that meet the criteria of high model fit validity, achieve quality data, and represent the potentialities of massage and body work therapy accurately and authentically.

Low Back Pain Research

Low back pain is a major health problem in modern society, with as much as 70 to 85% of the population experiencing low back pain at some time in their lives.[13] Past studies into the efficacy of massage therapy in reducing low back pain have been contradictory. A systematic review conducted by Ernst[10] in 1999 concluded, "too few trials exist of massage therapy for a reliable evaluation of its efficacy" and indicated "more investigation of this subject is urgently needed." Another meta-analysis assessing the effects of massage therapy on low back pain conducted in 2000 by Furlan et al.[14] concluded, "there is insufficient evidence to recommend massage as a treatment for low back pain."

The primary reason for the contradictory results in

previous massage research has been the result of poor-quality studies. This began to change in 2001with the publication of several high-quality research projects. A follow-up systematic review by Furlan et al.[9] in 2002 that included these new studies concluded: "Massage is beneficial for patients with subacute and chronic nonspecific low back pain in terms of improving symptoms and function."

Research Reviews

Two of the key studies indicating benefits of massage therapy for low back pain are "[r]andomized trial comparing traditional Chinese medical acupuncture, therapeutic massage, and self-care education for chronic low back pain" conducted by Cherkin et al.[3] and "[l]ower back pain is reduced and range of motion increased after massage therapy" conducted by Hernandez–Reif et al.[16]

The study by Cherkin et al.[3] compared the effectiveness of acupuncture, massage, and self-care for persistent back pain. A total of 262 patients age 20 to 70 years old with notable low back pain were computer randomized to receive one type of treatment over the course of 10 weeks. One of the strengths of the study was that it used trained and licensed professionals to perform the trials and allowed them to participate in the development of treatment protocols. Past research has been conducted using untrained people to provide massage protocols and, not surprisingly, the results did not support the benefits of massage.

In this study the acupuncturists practiced traditional Chinese acupuncture, were licensed, and had at least 3 years' experience. The acupuncturists and the research consultants created a treatment protocol that was considered clinically reasonable but excluded the use of Chinese herbs and Asian massage. The massage therapists were also licensed with 3 years' experience. The massage protocol focused on manipulation of soft tissue (muscle and fascia) with modalities such as Swedish, deep-tissue, neuromuscular, trigger, and pressure point techniques. Energy techniques and highly specialized techniques were specifically prohibited. Acupressure and shiatsu were also prohibited so as not to conflict with the acupuncture results. Self-care education consisted of books and videotapes demonstrating exercises and self-management techniques for low back care.

The outcome measures were obtained using telephone interviews, and focused on symptoms and dysfunctions. Patients rated their symptoms on a scale of 0 to 10 points. Dysfunction was rated on a modified Roland's Disability Scale of 1 to 23 points, the score relating to limitations on daily activities related to low back pain. Secondary outcomes were also examined. Outcomes were measured at the end of the 10-week treatment period and again at 52 weeks.

The results showed that at 10 weeks massage was superior to self-care and acupuncture on both the symptom and dysfunction scales. In the analysis there appeared to be no subgroups of patients more likely to benefit from a particular treatment. Also of interest, there was little variation in results among acupuncturists, suggesting that the personality or technique of the acupuncturist did not affect markedly the acupuncture outcome. The differences with massage therapists, however, approached significance.

The outcomes observed for massage and acupuncture at 10 weeks remained the same at 52 weeks. Massage was superior to acupuncture in its effect on symptoms and function. However, there were substantial improvements in the self-care group. After 52 weeks, the self-care group had somewhat better outcomes than the acupuncture group but less than the massage group.

This study concludes that therapeutic massage was effective for persistent low back pain, providing long-lasting symptom and function benefits. However, it does not establish why. The study includes in its possible explanations the specific effects of manipulation on soft-tissue structure and function or on pain sensation. Other possible explanations are the effects of general relaxation, the unexplained benefits of being touched therapeutically, of being given attention, and of increased body awareness and education about exercise and lifestyle. Later studies conducted by Kalauokalani et al.[17] suggest that patient expectations about the treatment they are receiving influence the clinical outcome and are an important factor in understanding the success of treatment.

In the study by Hernandez–Reif et al.,[16] massage therapy was evaluated against relaxation for chronic low back pain. The treatment effects were evaluated for reducing pain, depression, anxiety, stress hormones, sleeplessness, and for improving trunk range of motion associated with low back pain. Twenty-four adult men and women with low back pain were assigned randomly for massage therapy or progressive muscle relaxation. Sessions were 30 minutes twice a week for 5 weeks. Outcomes were measured by questionnaire, urine sample, and range of motion assessment. At the end of the 5 weeks the massage therapy group reported experiencing less pain, depression, anxiety, and improved sleep. Assessed trunk flexion was improved, and dopamine and serotonin levels were high. The conclusion is that massage therapy is effective in reducing pain, stress hormones, and symptoms associated with chronic low back pain.[16]

Research Limitations

Research in the field of massage therapy is challenging. The limitations within current studies make cross-comparisons difficult. Limitations include the lack of a uniform definition of low back pain, lack of a uniform definition of what constitutes massage therapy, the difficulty in blinding studies, and variable outcome measures.

There is no uniform definition of low back pain because there are many different causes. Some research studies excluded back pain resulting from known pathologies such as herniated disks, spinal injury, spinal stenosis, metabolic disorders, and so on. Other studies only required that the participants were experiencing low back pain for a given period of time. Cross-comparison of these studies can be misleading. Theoretically, massage will be more effective on low back pain of soft-tissue or functional origin. Patients with low back pain related to structural or metabolic pathologies might experience temporary pain relief from the reduction of muscle splinting, but as long as the underlying etiology remains, the pain will return. Future studies need to address the effectiveness of massage on low back pain from specifically identified causes, both structural and functional.

Typically the term *massage* is used generically, including a variety of techniques, and the degree of training required in performing trials is variable. One research project assessing the effectiveness of massage on pain in cancer patients used only light stroking techniques and trained the massage providers for 1 hour prior to the intervention.[24] This study may have assessed accurately the effectiveness of touch for pain in cancer patients, but using the term massage is misleading. Furlan et al.[14] state: "Our findings suggest that massage might be beneficial for patients with sub-acute and chronic low back pain especially if combined with exercise and *delivered by a licensed massage therapist*." The term massage needs to be defined, and results evaluated based on specific techniques and their outcomes. To assess the efficacy of massage, trained and qualified providers must administer the therapy.

Blinded studies in massage therapy are difficult to design. Sham interventions can blind the client but not the providers of the treatment. Studies comparing the effectiveness of massage therapy with other interventions are subject to the effect of client and therapist treatment expectation. There is a need for research comparing massage with an inert treatment that can adequately blind the data collection and factor out client expectation.

Different studies use different outcomes measures, each with their own benefit and drawback. Some use a combination of pain and functional scales (McGill Pain Questionnaire, Roland Morris Disability Questionnaire) that, although valid, can be subjective and available to behavioral input from the patient. Others use physiologic parameters (blood pressure, serotonin and dopamine levels, cortisol levels) that are useful in demonstrating massage effect but do not make a direct mechanical link between changes in physiology and changes in low back pain. Physical examinations of spinal flexibility, straight leg raises, and so forth, are considered secondary outcomes. The best studies use a combination of outcome measures.

Future Research

Case studies and anecdotal evidence indicate that massage is highly effective at reducing pain and improving function related to low back pain. Research studies are now beginning to verify massage benefits. The next step is studying the physiologic mechanisms of massage effects. Current theories focus on changes in circulation, release of neurotransmitters, adhesion mobilization, improved muscular efficiency, the psychologic impact of therapeutic touch, and the benefits of general relaxation and engagement of the parasympathetic response. Testing these theories with well-designed studies can help establish the extent to which massage can be an effective treatment for low back pain as well as other conditions. Understanding the mechanisms can help to improve the efficacy of technique and develop a better understanding of indications and contraindications for massage treatment. The end result may be an increased awareness of the benefits of massage, better coordination between standard medical treatment and CAM treatment, and improved quality of life for people with chronic pain.

SCOPE OF PRACTICE

Since the early 1980s, the profession of massage therapy has measured substantial growth as an allied health profession. During the last 20 years, massage therapy education has evolved and become more standardized. Currently 31 states regulate massage therapy; requirements still vary from state to state. These requirements may include the following:

1. Graduating from an accredited training school with a minimum number of hours of training. The Commission on Massage Therapy Accreditation (COMTA) is widely recognized as representing industry standards of educational competencies. COMTA achieved recognition by the United States Department of Education in July 2002. Currently there are 66 massage schools accredited by COMTA, and the latest statistics show a strong growth trend as these education standards are

adopted by schools across the country (approximately 40 schools attended the January 2003 COMTA Accreditation Workshop in preparation to begin the accreditation process, which represents a potential of 60% annual growth).[19]

2. Passing an examination that assesses knowledge and practice techniques. Board certification for massage therapy is through the National Certification Board for Therapeutic Massage and Bodywork (NCBTMB) and is recognized in 25 of the 31 states that regulate massage therapists.[7]

3. Continuing education credits in professional ethics are required for NCBTMB recertification. The largest and oldest professional organization for massage therapists is the American Massage Therapy Association. Both the American Massage Therapy Association and NCBTMB have published standards of practice.[20]

It must be noted that although massage therapists do not diagnose, they are highly capable of detailed soft-tissue assessment. "Massage Therapy does not encompass diagnosis, the prescribing of drugs or medicines, spinal or other joint manipulations, nor any service or procedure for which a license to practice medicine, chiropractic, naturopathy, physical therapy or podiatry is required by law."[6] There is a distinct difference between assessment and diagnosis. A diagnosis is an assigned name or label for an existing condition that is provided by a qualified health care provider such as a physician. Assessment is an ongoing process of information gathering that is used to help in making clinical decisions.

> Clinical massage therapists view the body from a different perspective from that of the physician. We do not treat conditions according to medical diagnostic criteria, but according to clinical massage therapy assessment criteria. For example, a physician might diagnose a patient as having tendonitis. This diagnosis implies an inflammation of a tendon, indicating a prescription of anti-inflammatory medication, rest and application of ice. The same person might be assessed by a clinical massage therapist as having persistently contracted muscle tissue with referred pain from trigger point activity, indicating deep tissue therapy and trigger point compression. The physician and the clinical massage therapist are addressing the same complaint in the same patient from two different perspectives. Neither is wrong and each perspective may inform the other.[4]

Increasingly, massage is being prescribed for a variety of injuries and conditions. Massage therapists often work closely with physicians, physical therapists, and chiropractors. Massage can be effective for a variety of common orthopaedic conditions including pinched nerves, bursitis, sciatica, fibromyalgia, arthritis, carpal tunnel syndrome, tennis elbow, rotator cuff injuries, migraine and tension headaches, transmandibular jaw and chronic low back pain. With increased inclusion in the therapeutic protocol of rehabilitative care comes the responsibility of the massage therapist to assess their recipients and dialog effectively with all other health care providers. Schools of massage therapy are increasingly taking on the challenge to provide better assessment training in their programs, as well as providing continuing education access to those already in the field.[5]

The results of a study conducted by Studdert et al.[22] concluded that "malpractice concerns alone should not inhibit physicians from referring patients to alternative medicine practitioners, particularly where those practitioners are licensed and accredited. . . . Physicians who may be concerned about their own exposure to liability for referral of patients for alternative treatments can draw some comfort from these findings."

ASSESSMENT METHODOLOGY

Evaluation of the client is performed to ensure a safe and effective session. A massage practitioner uses assessment skills to evaluate the nature of his client's complaint, ensuring that the current approach or method of treatment is the most effective for each individual. Systematic assessment procedures for testing soft-tissue functionality, like that presented by Whitney Lowe[18] in his widely used text book, *Functional Assessment in Massage Therapy*, has raised the bar on the educational skills modern massage therapists possess. Lowe states that

> [k]eeping the client's health and well-being foremost in mind is important since massage therapists and some other practitioners of massage are direct access providers. While direct access is a wonderful opportunity for the client and massage practitioner alike, there is an increased responsibility that comes with it. Massage practitioners who enjoy direct access must have some form of assessment skills to determine if each client's condition is something that could be helped by massage.[18]

Lowe points out that

> the use of these skills of assessment is both an art and a science. One of the most important aspects of assessment procedures is to match the physiology of the tissue injury with the physiological effects of the specific treatment methods. That is the science. However, often, it is the intuitive, artistic and imag-

inative side of our brain which is more effective at synthesizing feedback from our evaluations and determining how to use that information. That is the art. The massage therapist's primary interest, from an orthopaedic perspective, is to help patients move and function better. The limitations to proper function may not only be mechanical problems with anatomic structures, but may involve other complex areas like psychosocial dynamics as well. Therefore it is essential to keep a "big picture" view.[18]

Assessment methodology includes:

1. A thorough health history that, beyond basic information, may include current complaints, modes of treatment to date, current medications, past health conditions, surgeries, specific restrictions, and names of primary and treating physicians. In many instances the client intake form is comparable with a basic medical patient intake form.
2. Visual assessment of the client's overall structure and posture, statically and in motion, through gait analysis, to determine areas and qualities of movement or lack thereof.
3. Palpatory assessment, which is the core competence for a professional massage therapist. Leon Chaitow,[2] in his book *Palpation Skills*, uses the image of music to describe the role of palpation: "The instrument that therapists play is the human body, and the development of palpatory literacy allows us to 'read' that body."[2] More than anything else, the gift of a skilled massage therapist is the ability to "read" the body, analyze what is being felt/sensed through the hands, and then choose from a wide array of technique options to encourage the tissues of the body toward ease, balance, and health.
4. Special orthopaedic tests for the purpose of ascertaining the regions of greatest need and appropriateness of the specific techniques to be used. The scope of practice restricts massage therapists from using these tests for the purposes of diagnosis.

A concise model of the assessment protocol is best described by Walton.[23] Her components of massage safe practice— basic decision-making algorithm as seen in Figure 1, provides the core dynamic of client assessment from pathology to specific massage session modifications.

GENERAL PRECAUTIONS, CONTRAINDICATIONS, AND GUIDELINES

Although therapeutic massage is considered safe, under most circumstances, there are a number of instances when massage may prove inadvisable or, perhaps, contraindicated. Some of the more common conditions that warrant particular caution may be broken into seven basic categories. The following information is not an exhaustive compilation of conditions, but provides examples of the types of conditions requiring caution. In Connecticut, "Massage Therapists have an affirmative duty to make a written referral to a licensed healing arts practitioner, of any client who has any physical or medical condition that would constitute a contraindication for massage therapy or that may require evaluation or treatment beyond the scope of massage therapy."[6]

1. Conditions involving an acute inflammatory process in its most active state, such as appendicitis, active rheumatoid arthritis, or febrile states, are typically contraindicated. The application of massage may cause increased blood supply to areas of swelling, thus causing a potential exacerbation of symptomology. Although this improved vascular supply is generally considered a benefit of therapeutic massage, inflammatory states provide the exception.
2. Areas of abnormal sensation warrant particular care and, although not truly contraindicated, must be approached with caution. Those clients with diabetes, post-CVA, amputees, or those individuals who have been prescribed muscle relaxants or medication for pain will experience diminished sensation awareness and may not be able to offer the massage therapist accurate feedback regarding the depth of pressure or their personal pain threshold. Likewise, clients who have been diagnosed with conditions such as shingles will also have aberrant pain sensitivity awareness. Despite the benefit derived from massage to a region of scar formation, relative to altering the laying down of collagen, thus assisting a mode of tissue healing, by primary intention, both surgical and nonsurgical scars must be approached by the therapist with increased caution.
3. When a traumatic insult has occurred, there may be varying degrees of soft-tissue damage and bleeding. Posttraumatic episodes such as falls, sprains, whiplash, or areas of marked bruising are of particular concern. Typically, a waiting period of 24 to 72 hours is typically necessary before massage may be performed routinely. During this time, the client should be advised to apply appropriate RICE procedures to reduce further the effects of the trauma.
4. A compromised immune system, as with a recent organ transplant, certain chemotherapeutic and radiation protocols, or a disease process such as acquired immune deficiency syndrome, results in

V. Components of Massage Safe Practice – Basic Decision Algorithm[27]

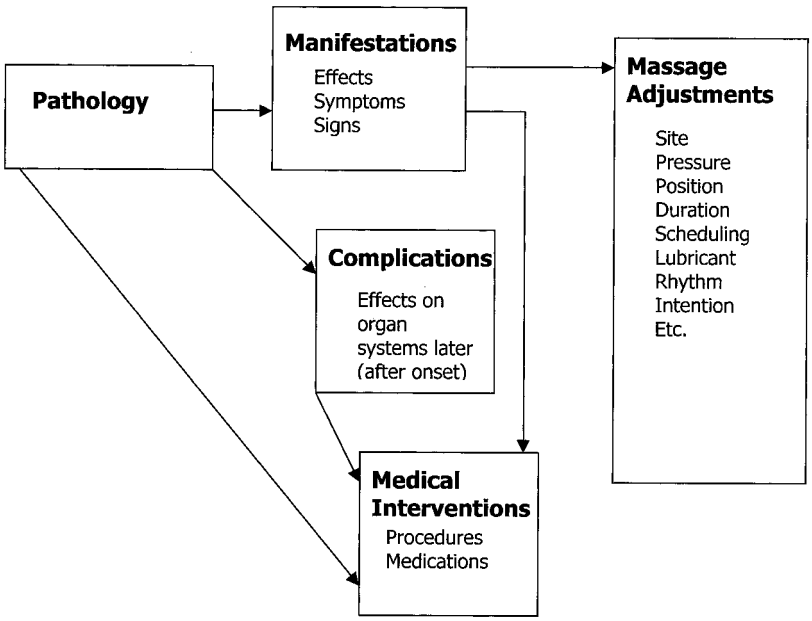

FIG. 1. Components of massage safe practice—basic decision-making algorithm.[23]

Adapted, with permission from Tracy Walton's *Clinical Decision Making Tree*

limits to the massage contact. Therapists have traditionally worked in private offices and have had only limited contact with this client base. Now, with an increasing number of massage therapists working in hospitals, there is a renewed emphasis on awareness of hospital protocol to address immunosuppressive needs. The otherwise positive effect of improved lymphatic fluid movement and beneficial stress reduction, in the case of immune suppressive states, could further compromise the client if appropriate precautions are not observed.

5. Circulatory and vascular conditions involve varying degrees of caution and restriction. In particular, cardiac arrhythmias, diagnosed carotid or aortic bruits, thrombophlebitis, tortuous varicose veins, and even atherosclerosis are considered most contraindicated for massage.
6. Clients who have lost structural integrity require assistance on and off the table, specific positioning, and proper support on the table. Recent surgery, joint replacements, and severe rheumatoid arthritis all warrant notable precautions and discussion with the client's physician.
7. Pathologic conditions that can be spread along the skin through the lymph or through the bloodstream make up the last category. Impetigo, lymphangitis, and malignant melanoma are some of the pathologies that limit substantially the application of massage, whether because of their contagious nature or risk of metastatic potential.

MASSAGE TECHNIQUES AND ASSOCIATED BENEFITS

Over the years, many massage techniques have developed that offer not only a means of diversifying a practitioner's ability to work with a variety of conditions, but the opportunity to achieve a commonality of language. There have been few research studies into the applications and effectiveness of specific therapeutic

massage techniques. Most of the information has been gleaned from the clinical successes of the individual therapists. That said, the following information is based on the anecdotal information provided by clinical application. It is supported historically as well as by the degree of satisfaction reflected in public opinion. Research information, to the extent it is available, may be found in its own section within this article.

The techniques described follow a combination order of superficial to deep, basic to advanced, and most commonly used to least. This list is by no means complete, but does reflect the more universally held approaches in the field today. The sequence does not reflect any personal, preferential attitude. Our description is a compilation of experiential descriptions and effects, gathered over more than 20 years. A specific protocol, developed by Robert Pecora, follows this section to offer the reader a step-by-step experience with one specific orthopedically oriented approach.

Superficial Effleurage

Superficial effleurage involves any stroke that glides over the skin without attempting to move the deep muscle masses. This technique promotes a general neuromuscular relaxation by sedating the sensory nerves of the skin. It is used commonly to apply and distribute the lubricant oil or lotion. The massage therapist may use this technique to acclimate the client to their touch and to prepare the body to receive deeper strokes. The initial assessment of tissues begins with these effleurage strokes.

Deep Effleurage

Deep effleurage continues the gliding stroke of the superficial form but provides enough pressure to produce mechanical as well as reflexive effects. This deeper stroke mechanically assists local venous and lymph flows. As a direct result of general muscular stimulation (increased circulation), this deeper technique promotes metabolic waste removal and enhances the delivery of oxygenated blood and nutrients throughout the body. Deep effleurage supports muscular health, greater pliability, flexibility, muscle tone, and contractibility via gentle compression and stretching of the superficial soft tissues. This deeper application promotes general relaxation or, conversely, stimulation to the sensory nerves of the skin, depending on the rhythm or pace used.

Pettrissage

Strokes that contract and activate the deep muscle tissue by firmly lifting, pulling, rolling, wringing, or squeezing the muscle mass are described as petrissage. These are kneading strokes that alternately compress and release the muscles under the skin. There is no gliding over the skin except between progressions from one area to another. This is a much more stimulatory technique than the previous two. Petrissage accelerates local venous and lymphatic circulation, thereby "milking" metabolic waste from tissues and bringing increased arterial blood flow to the tissue. (Note: There is some controversy, within the massage profession regarding whether circulatory flow is actually increased or the vessels relax and thereby dilate to allow a less impeded blood flow.)

Tapotement

Also known as percussion, tapotement is a series of brisk blows, following each other in a rapid, alternating, rhythmic fashion. This technique is visually associated with the classic "massage" found in the older boxing movies of the 1940s. More accurately, it is a highly diversified approach with several variations, depending on which part of the hand is used. With each striking movement, the muscles first contract and then relax. Toning of muscles and local circulatory assist are considered to be key effects. It is stimulatory when performed for short periods of time, but becomes sedative when performed over a longer span of time. Precautions include areas of hypo- or hypersensitivity (such as tender areas, bony places, and kidney region) and spasticity, and use for clients with abuse issues.

Vibration and Shaking

Vibration is a fine, tremulous movement made by the hand or fingers placed firmly against a body part, causing the part to vibrate. Shaking is a much more coarse action made by picking up a muscle belly and moving it gently back and forth; it also can be done with an entire limb. These approaches are used medically for soothing peripheral neuritis, assisting lung drainage (along with "cupping" percussion), relieving tender scar tissue and phantom limb pain, and stimulating peristalsis in the intestines. Limitations to the use of vibration and shaking include hypersensitivity to pain, acute inflammation, fever, and suppuration.

Rhythmic Compression

Rhythmic compression involves a repetitive, rhythmic pumping of the muscle belly. Pressure is applied with the intention of moving the muscle toward the bone and is firm enough to meet the resistance in the tissue. The more resistant the tissue, the more shallow the compression and the slower the rhythm. The more pliable the tissue, the deeper the thrust and less frequent the application. Rhythmic compression creates a durable hyper-

emia, spreads muscle fibers, broadens muscle tissue, stretches and releases fascia, improves circulation, and promotes general relaxation. There is a body–mind benefit of releasing unconscious holding on the part of the client.

Conditions that limit the use of compressions include varicose veins or areas where there is danger of blood clots (e.g., phlebitis), osteoporosis or compromised bone conditions, recent injury or surgery, and any local region of the body where the integrity is compromised.

Sustained Compression

Sustained compression is sustained pressure applied to a contracted area with sufficient force and for a long enough time to release or inactivate it. This approach may be used on acupressure points, to inactivate trigger points, to release large areas of contracted tissue, or to stretch tissue. Direct pressure is applied to an area, creating ischemia. The body responds, after release, with hyperemia. This approach reduces pain and increases the ability of a muscle to function in a normal way, achieving full range of motion and a normal resting length of the muscle. Ischemic compression may be contraindicated if the area is too irritable to respond to this technique. Likewise, with pregnancy, there are certain points not to be compressed.

Deep Transverse Friction

Deep transverse friction involves movement at a 90° angle to the direction of the muscle fibers, most often applied to the muscular attachments. The stroke crosses the fibers in both directions to stretch, separate, and align fibers. It may be used to address specific injuries through stretching and separating the fibers, increasing range of motion, promoting freer movement, breaking down adhesions in muscles and fascia, and increasing local circulation.

Cross-Tissue Massage

In cross-tissue massage, strokes are applied in one direction at a 45 to 90° angle to the muscle fibers. The intent is to create a hyperemia and to spread the muscle fibers. A therapeutic effect is achieved by the repetition and direction of the stroke, not the pressure. Strokes may be broad or specific. Benefits include increased blood supply to the specific area, flushing of toxins from the area, separating muscle fibers, and releasing tissues that are tight because of chronic muscle tension, fascial adhesions, or poor circulation.

Skin Rolling

Skin rolling is performed by lifting the skin and fascia away from the underlying muscles and gently compressing the tissue between the thumbs and fingers. The tissue is then gently "rolled" by slowly walking the fingers across the body. Skin rolling may result in the release of fascial adhesions, increased circulation to the area, and increased pliability of the tissue.

Myofascial Release

Some approaches seek to break the hydrogen bonds through compressive twisting force. Some seek to liquify the ground substance through slow compressive stretching. Some seek to modify the energetic potential of the tissue, thereby changing the hydrogen bonding. Some combine elements of all these techniques. The trademark of fascial work is slow, energetic, and responsive. Most types of fascial work include an awareness of the emotional component to injury and compressive forces, and many times emotional release is an outcome of myofascial work. It may include stretches, striping, compressions, deep-tissue sculpting, leg and arm pulls, and craniosacral holds.

The benefits include freeing adhesions, allowing greater range of motion, assisting neuromuscular coordination, diminishing pain, allowing for postural and structural rebalancing, emotional processing, improved biomechanical efficiency, reduction of fatigue from muscle inefficiency, improved flexibility and suppleness of muscle tissue, and reduced likelihood of injury during workouts. Myofascial release is indicated with scar tissue from surgeries, restricted movement, and the need for pain reduction. Clients experience an improved recovery and repair process along with this reduction of pain.

Myofascial release is limited by a number of contraindications, including malignancy, inflammation of connective tissue, febrile states, infection, acute circulatory conditions, osteomyelitis, aneurysm, acute edematous states, acute rheumatoid arthritis, open wounds, sutures, hematoma, healing fractures, osteoporosis, hypersensitivity of the skin, and anticoagulant therapy.

Positional Release

This technique involves the positioning of a region or the whole body in such a way as to achieve neurologic and circulatory changes that lead to improved function and reduced pain. It can effectively and rapidly ease pain, improve function, increase range of motion, and assist in deactivating trigger point activity. By taking a distressed, strained, chronic, or acute muscle or a joint into a so-called position of ease, a major modification takes place involving neural reporting, which relaxes

hypertonic tissues and improves local circulation. The end result of such positioning, if performed slowly and held for an appropriate period of time, is the reduction in neural hyperactivity and the resetting of the muscle spindles to normal resting length of muscles, thus allowing for improved circulation for previously oxygen-deprived tissues.

Passive Range of Motion

During passive range of motion, the therapist takes the client's joints through their current or normal range of motion without assistance from the client. Passive range-of-motion techniques will stretch shortened ligaments and tight muscle and fascia in a regional area. There will be an increase in blood supply and nutrition to joints and surrounding muscles. This approach assists in the movement of lymphatic fluids, stretches and stimulates nerves in the area, and helps to loosen adhesions and muscle contractures.

Depending on the severity or acute nature of the following conditions, as well as the skill of the therapist, there are conditions that restrict the use of range-of-motion techniques. Infection or certain types of edema when present in the joint space are contraindicated. A joint in an acute state of pain is a contraindication, although some movement within the pain-free range can help keep adhesions from forming and promote circulation and healing; a joint in an active state of inflammation, redness, swelling, as in rheumatoid arthritis or bursitis; or in cases of recent surgery, injury, or dislocation of a joint. In cases when the ligaments are overstretched and do not support the joints adequately, such as with ballet dancers, gymnasts, or other athletes who have experienced repetitive injuries to a specific joint, it is best to avoid range-of-motion techniques unless the therapist has more advanced training.

Muscle Energy Techniques

Muscle energy techniques are active muscular relaxation corrective techniques that involve gently guided movements that are coordinated between the therapist and client. The therapist guides the client's own muscle energy or efforts using proprioceptive neuromuscular facilitation techniques. Muscle energy techniques are treatments in which clients, on request, actively use muscular effort from a controlled position, in a specific direction, against a distinct counterforce by the therapist. By balancing the efforts of agonist and antagonist muscle groups, the client will experience reduced spasm and pain, and increased range of motion. Once restrictions are released and mobility and function increased, the body's self-correcting mechanisms are facilitated, thus easing clients' symptoms and improving overall function.

Proprioceptive Neuromuscular Facilitation

This is a technique used to enhance stretching. It is based on a neuromuscular response to muscle contraction because a muscle has a reflexive tendency to relax after it has contracted. Contract/relax techniques use the Golgi tendon organs to facilitate relaxation. A general rule is that the greater the contraction the greater the subsequent relaxation.

THERAPEUTIC MASSAGE FOR LOW BACK RELEASE PROTOCOL

Although many massage therapists often assert that each client, treatment plan, and session is unique, clearly certain standard treatment procedures are accepted widely by most therapists. Some of these clinical assumptions may include that a treatment session:

- Has a systematic, integrated, well-organized flow within the designated time
- Addresses the whole client physically, psychoemotionally, and spiritually
- Progresses from a general focus to specific, and concludes with general
- Progresses from light, superficial pressure to deep and concludes with light within each section (i.e., body region or phase) of the massage
- Often begins by working on the more functional side of paired musculoskeletal structures before working on the primary problem area
- Often clears the surrounding tissues of holding patterns, trigger points, and so forth, before treating the core tissues of the dysfunction
- Requires increased frequency of shorter duration, the more acute the problem (two to three half-hour sessions per week for 2–3 weeks) and conversely, longer (1–1.5 hours), weekly or biweekly sessions for chronic problems

Similarly, certain types or combinations of technique are emerging as being more effective for the treatment of certain conditions. The treatment protocol for low back pain described here is one such example, as seen in Figure 2. It is a combination of range of motion, rhythmic and sustained compression, myofascial release, positional release, muscle energy, and proprioceptive neuromuscular facilitation techniques. This protocol was developed by Robert Pecora during his 8 years as a licensed massage therapist and 24 years as a physical therapy assistant, through thousands of hours of clinical application working in the area of orthopaedic massage and rehabilitation.

If performed correctly, these techniques flow sequen-

VIII. Algorithm for low back release

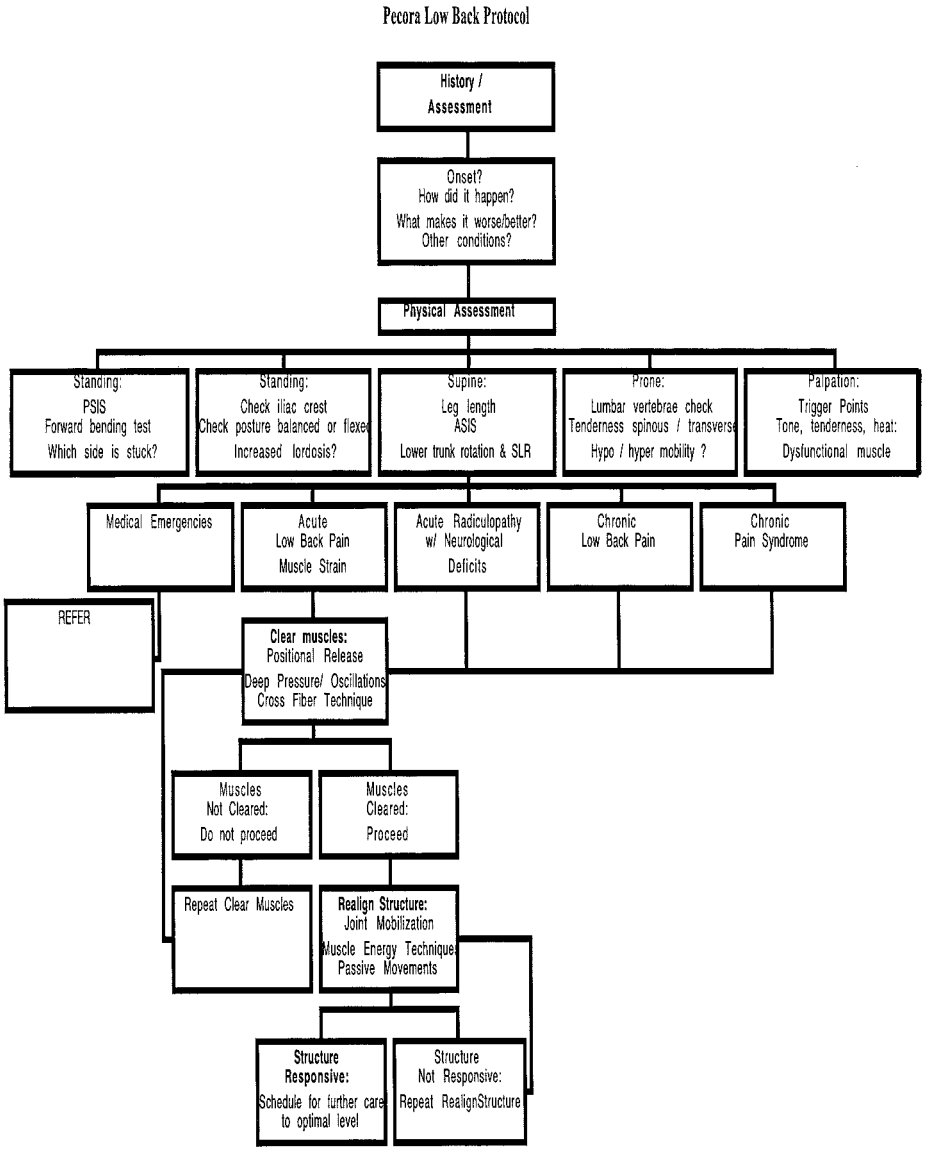

FIG. 2. Algorithm for low back release.

tially so that the therapist can maintain optimal body mechanics and posture while transitioning from one technique to the next for the duration of the session. This biomechanical control conveys confidence and reassurance to the client and allows the therapist to sensitively and responsively apply the required pressure with minimal physical strain.

This protocol is aimed at the treatment of specific low back restrictions, whether they be skeletal, muscular, neural, connective tissue problems, or a hypermobility issue causing pain and discomfort, which can be eased and then referred for rehabilitation and strengthening. As we have indicated previously, massage therapists cannot diagnose, but can take a thorough history and assessment, thereby pinpointing problem areas. Restrictions can then be addressed for reducing pain and discomfort and improving functional range of motion as well as quality of life.

1. Goals: Short-term goals are to normalize dysfunctional tissue and to provide neuromuscular reeducation. Long-term goals are to improve posture and body mechanics to minimize load (strain) on lumbar spine, pelvis, and hips.

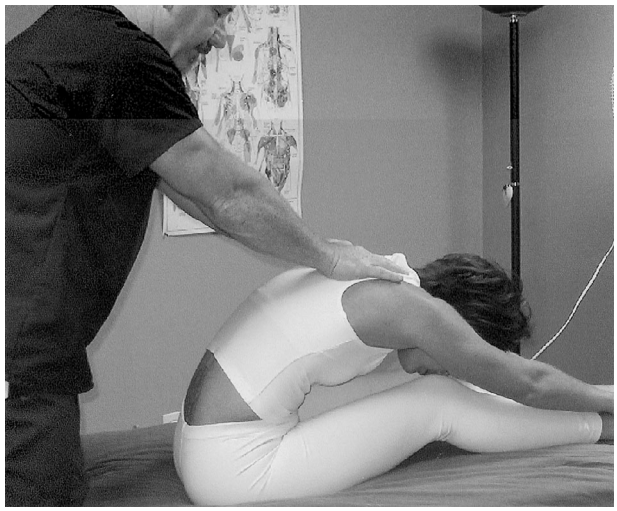

FIG. 3. Forward bending.

2. A detailed history is taken.
3. A visual assessment of the underlying cause of the low back discomfort. Patient's gait pattern is assessed as the patient enters the office. The assessment includes a postural analysis, which indicates which muscles are hypertonic and which are hypotonic.
4. Palpatory assessment:

Standing:
Check posterior superior iliac spine
Forward bending test
Which side is stuck?
Check iliac crest
Which side is higher?
Determine whether posture is good or forward flexed
Is there increased lordosis in lumbar spine or is it straight?
Supine: Check leg length
Check anterior superior iliac spine
Check lower trunk rotation with lumbar roll (Fig. 3)
Check straight-leg raise for low back pain and hamstring tightness
Palpate all muscle groups for trigger points, increased tone, tenderness, and heat, and check general tissue texture for a dysfunctional muscle
Prone: Check lumbar vertebrae for proper biomechanics and alignment
Check for tenderness with palpation of spinous process and transverse processes
Check hypo- and hypermobility using posterior anterior glides and lateral glides
Palpate all muscle groups for trigger points, increased tone, tenderness, and heat, and check general tissue texture for a dysfunctional muscle

5. The technique: The technique is directed at the problems causing low back pain or what appears to be low back pain. Structurally, this includes L1 to L5, the sacroiliac joint, hips, and pelvis. Specific muscles include the extensors of the back and the gluteal muscles, abdominal flexors and iliopsoas muscle, and lateral obliques. Connective tissue involvement includes regional tendons, ligaments, fascia, scar tissue, joint capsules, and neural tissue. Reflex areas, aka trigger points, must be localized. Referred pain from nerve root involvement is noted. Attention is paid to any proprioceptor involvement affecting hypertonicity, spasm, or imbalance in either postural or phasic muscles creating a distortion of the low back (lumbar spine) and pelvis area.
6. The procedure: The client is positioned supine. The therapist reassesses the problem area found during the initial assessment. The therapist stands on the side of the problem area. When the client is in the supine position, the therapist flexes the hip and knee to 90° and slowly rotates the lower trunk toward the opposite side. If the client is unable to lay supine, the technique may be performed in a side-lying position, supported with pillows. When using the side-lying posture, the upper trunk rotation is performed toward the therapist, which essentially is the same as lower trunk rotation in the supine position. Two things are noticed by the therapist (Fig. 4). First, the client's subjective response to pain, discomfort, or tightness is noted. Subjective responses to the severity and range of pain are assessed through a 10-point pain scale (0 point, no pain; 10 points, severe pain). Second, the therapist's objective palpation of decreased range of motion is noted with regard to whether the range ends in a soft or hard end feel. Soft end feel indicates muscular or fascial tightness; hard end feel indicates a skeletal block or obstruction. Differentiating the type of barrier involved is critical to understanding the problem and treat it effectively. These restrictions, whether they are skeletal, muscular, or fascial, are initially treated similarly. The technique is fine-tuned through treatment and reassessment until:

- The client reports decreased pain and discomfort, using the pain scale (subjective)
- The therapist determines increased functional range of motion in the area of the low back, hips and pelvis (objective)
- The client and therapist determine that the patient is

FIG. 4. Trunk rotation.

moving with greater ease during functional mobility on and off the table

- The therapist determines improved range and quality of end feel

The technique is performed using the therapist's knee as a lever. Using the knee gives the added advantage of applying treatment during assessment. The therapist places his knee at the area of pain, discomfort, or tightness (Fig. 5). The therapist then uses his body weight, leaning over the flexed knee with both arms on top of the knee and begins moderate oscillations toward the point of restriction where the knee is placed. The angle of the flexed hip can vary from 45 to 110°. Abduction or adduction varies from neutral to end point depending what the therapist has assessed will work best to release the restriction. Pressure is applied moderately depending on the size and age of the client. Oscillations are performed at 10 to 20 repetitions, and the client is reassessed by performing lower trunk rotation, which has an added value of stretching the mobilized tissue. The therapist

FIG. 5. Oscillation.

then takes up the slack and performs the procedure again until the therapist feels enough progress has been made during that session. Next the therapist again brings the client into lower trunk rotation, to a new and improved range of motion (Fig. 6). From this position, the technique is continued. While stabilizing the client's hip and thigh, the client is asked to perform knee flexion and extension of 5 to 10 repetitions. Next, with the client's knee extended, the client is asked to perform ankle pumps of 5 to 10 repetitions. The active performance of knee flexion and extension followed by ankle pumps stretches the hamstrings and calf muscles, and initiates nerve glides at the nerve root and down the lower extremity. It also influences the dura by providing relief of discomfort and increased mobility. The therapist then assists the client back into neutral and again assesses the client's progress by observing subjective and objective results.

7. Physiologic outcomes:

Structural effects (lumbar L1 to L5, sacroiliac joint, hips and pelvis)

Release of joint capsule restrictions (e.g., scarring, adaptive shortening)

Stimulation of proprioceptor response to decrease hypertonicity and pain (e.g., mechanoreceptor to decrease pain, Golgi tendon to relax muscle tissue)

FIG. 6. Improved range of motion.

Improved mobility in joints where a degeneration process is present

Soft-tissue effects (muscles, connective tissue, reflex areas [i.e., trigger points])

Normalization of hypertonic tissue

Release of scar tissue

Release of ischemic areas

Release of trigger points and their referral patterns

Decreased of hypersensitivity of tissues

Increased blood flow

Neurologic effects

Temporary or prolonged relief from nerve impingement resulting from soft-tissue occlusion

Pain relief for pre- and postsurgical procedures

Neuromuscular reeducation of muscular, connective, and neural tissue

Medical Massage Therapy Program

The Connecticut Center for Massage Therapy offers a 650-hour medical massage therapy program in conjunction with Hartford Hospital. This program includes training in all aspects of therapeutic massage education and technique, with a specialized clinical segment. During the final term of the 20-month program these students participate in a hospital clinic during which they offer massage therapy to patients, family members, and hospital staff of Hartford Hospital in the orthopaedic, oncology, and cardiology units. It represents a thorough orientation to:

- Assessment skills and protocols for massage within the medical setting
- Benefits, contraindications, and special considerations for select patient populations
- Clinical application of massage therapy techniques in acute and subacute care settings
- Structure and flow of a hospital unit, medical terminology, documentation, and effective communication practices with medical staff

We are defining medical massage, in the context of this hospital training, in a broad way. If massage is to be administered to patients in an acute care or in a hospice setting, the orientation is palliative. It can also be effective as a treatment modality in a subacute, rehabilitative phase. Currently, it is just as likely that the graduates of the medical massage therapist program will remain in their own private practices and receive referrals from medical practitioners.

Having massage therapists working within the hospital provides a rich opportunity for increased awareness. Medical staff learns about how massage therapy can be integrated into and improve patient care. Nursing staff reports that patients receiving massage frequently experience greater ease, less pain, and much needed quality rest/sleep. Students are learning about the potential impact of their gifts of touch within the hospital environment. Patients are learning how therapeutic massage can help to ease the pain, trauma, and other symptoms associated with acute and chronic illness and hospitalization.

The presence of healing touch in the midst of acute care can alter profoundly not only the experience of the patient but the experience of their family and health care providers as well. Studies show that the pain and anxiety levels for hospital staff are often nearly as high as they are for their patients.

> *The demands on helping professionals to confront so much suffering each day are immense. "Professional warmth" is a survival strategy. But it's no answer. Our hearts pay the price, helpers and helped alike. Fortunately, awareness of this problem is growing. "The question of suffering and*

its relation to organic illness has rarely been addressed in the medical literature," reported the prestigious New England Journal of Medicine in a special article devoted to this issue. But what does it say about our habits that this concern has been such a long time coming?[8]

CONCLUSION

We are in the midst of a confluence of cultural influences that are supporting the blending of complementary and alternative therapies with conventional medicine in the treatment of low back pain. Patients are seeking to receive their care from a primary physician who supports them in maneuvering the integration of treatment options. It is the task of massage therapists to continue to work for standardization of education, credentialing, and best-practice protocols of treatment supported with sound research foundation while maintaining the paradigmatic underpinnings of the wholistic modality that it is. If physicians become more familiar and comfortable with the potential benefits of massage therapy for low back pain and other conditions for which massage may be clinically effective, they will have access to another treatment dimension for their patients.

Dr. James Gordon, Chairman of the White House Commission on Complementary and Alternative Medicine Policy predicts the following:

Within five to ten years, complementary therapies will be a part of the care in every major hospital and clinic across the country, and our definition of medicine will be far larger than it is today. The questions are not "if" or even "when" this will happen. The questions that must be answered, and the ones the Commission will address, are how we can find out which of these therapies are truly effective; how clinicians can get trained in using them and the public educated about them; and how those therapies that do prove effective will be safely integrated into a truly comprehensive and humane care for all Americans.[15]

REFERENCES

1. Cassidy C. *Methodological issues in investigations of massage/bodywork therapy* [American Massage Therapy Association Foundation Web site]. 2002. Available at http.//www.amtamassagefoundation.org/massageagenda/methodologiesdocument. Accessed February 5, 2003.
2. Chaitow L. *Palpation Skills: Assessment and Diagnosis Through Touch*. London: Churchill Livingston, 2001.
3. Cherkin DC, Eisenberg D, Sherman KJ, et al. Randomized trial comparing traditional Chinese medical acupuncture, therapeutic massage, and self-care education for chronic low back pain. *Arch Intern Med* 2001;161:1081–8.
4. Clay JH, Pounds DM. *Basic Clinical Massage Therapy: Integrating Anatomy and Treatment*. New York: Lippincott Williams & Wilkins, 2003.
5. COMTA. *Policy/Procedures/Standards Manual* [COMTA Web site]. Available at http://www.comta.org/pdf/-standards.4pdf. Accessed February 5, 2003.
6. *Connecticut Massage Statute* [state of CT Web site]. Available at http://www.cga.state.ct.us/2001/pub/Chap384a.htm.
7. *Consumers' Guide to Massage Therapy* [NCBTMB Web site]. Available at http://ncbtmb.com/consumers_guide.htm. Accessed February 5, 2003.
8. Dass R, Gorman P. *How Can I Help? Stories and Reflections on Service*. New York: Alfred A. Knopf, 1991.
9. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990–1999: results of a follow up national survey. *JAMA* 1998;280:1569–75.
10. Ernst E. Massage therapy for low back pain: a systematic review. *J Pain Sympt Manage* 1999;17:65–9.
11. Fernandez CV, Stutzer CA, MacWilliam L, Fryer C. Alternative and complementary therapy use in pediatric oncology patients in British Columbia: prevalence and reasons for use and nonuse. *J Clin Oncol* 1998;16:1279–86.
12. Freeman LW. Massage—the touch of healing. In: *Best Practices in Complementary and Alternative Medicine*. New York: Aspen Publishers, 2002.
13. Furlan AD, Brosseau L, Imamura M, Irvine E. Massage for low back pain: a systematic review within the framework of the Cochrane Collaboration Back Review Group. *Spine* 2002;27:1896–910.
14. Furlan AD, Brosseau L, Welch V, Wong J. Massage for low back pain. *Cochrane Database Syst Rev* 2000;4:CD001929.
15. Gordon J. From his speech upon being appointed as Chairman of the White House Commission on Complementary and Alternative Medicine (CAM) Policy, on July 13, 2000.
16. Hernandez–Reif M, Field T, Krasnegor J, Theakston H. Lower back pain is reduced and range of motion increased after massage therapy. *Int J Neurosci* 2001;106:131–45.
17. Kalauokalani D, Cherkin DC, Sherman KJ, Koepsell TD, Deyo RA. Lessons from a trial of acupuncture and massage for low back pain: patient expectations and treatment effects. *Spine* 2001;26:1418–24.
18. Lowe W. *Functional Assessment in Massage Therapy*. 3rd ed. Bend, OR: Orthopedic Massage Education and Research Institute, 1997.
19. Massage Education and Institutions [COMTA Web site]. Available at http://www.comta.org/trainprog/htm. Accessed February 5, 2003.
20. Massage Information Center [American Massage Therapy Association Web site]. Available at http://www.amtamassage.org/infocenter/home.html. Accessed February 5, 2003.
21. Prevention of Spinal Injuries [Academy of Orthopedic Surgeons Web site]. Available at http://www.aaos.org/prevention/spine. Accessed February 5, 2003.
22. Studdert DM, Eisenberg DM, Miller FH, et al. Medical malpractice implications of alternative medicine. *JAMA* 1998;280:1610.
23. Walton T. *Caring for Clients With Cancer Course Notes*. Newington, CT: CT Center for Massage Therapy, June 7–9, 2002.
24. Weinrich S, Weinrich M. The effect of massage on pain in cancer patients. *Appl Nurs Res* 1990;3:140–5.