



Peter O'Neill. *No Swimming*. Oil on linen, 40" × 60".

*Massage appears safe and can reduce stress and anxiety in cancer patients.*

# Safety and Efficacy of Massage Therapy for Patients With Cancer

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**Background:** As the popularity of complementary/alternative medicine (CAM) grows, patients are incorporating more CAM therapies into their conventional cancer care. Massage therapy, a CAM therapy known primarily for its use in relaxation, may also benefit patients with cancer in other ways. Massage can also be associated with risks in the oncology population. Risks can be minimized and benefits maximized when the clinician feels comfortable discussing CAM with his or her patients. This article reviews and summarizes the literature on massage and cancer to help provide the clinician with information to help facilitate discussions with patients.

**Methods:** MEDLINE and CINAHL databases were searched to identify relevant articles. These were reviewed for content and other pertinent references.

**Results:** Significant information was extracted from these resources to provide this overview of the use of massage for patients with cancer.

**Conclusions:** Conventional care for patients with cancer can safely incorporate massage therapy, although cancer patients may be at higher risk of rare adverse events. The strongest evidence for benefits of massage is for stress and anxiety reduction, although research for pain control and management of other symptoms common to patients with cancer, including pain, is promising. The oncologist should feel comfortable discussing massage therapy with patients and be able to refer patients to a qualified massage therapist as appropriate.

## Introduction

Cancer patients often use complementary/alternative medical (CAM) treatments as adjuncts to conventional

cancer care, but oncologists have not routinely received education about these therapies and may be uncomfortable discussing them with patients. To maintain a supportive patient-physician relationship, these issues must

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**Abbreviations used in this paper:** CAM = complementary/alternative medicine.

be addressed. Open discussion of all therapies, including CAM treatments, can lead to better treatment tolerance and compliance and thus improved outcomes.

Massage therapy is one form of CAM treatment often used by cancer patients, although patients may receive conflicting information about the use of massage with cancer. Some sources heavily promote the use of massage for cancer patients, while others believe it to be contraindicated. This review seeks to help the clinician feel comfortable and informed about conversations with their patients regarding the appropriate, safe, and effective use of massage. The article also reviews the current literature on the use of massage therapy by cancer patients, including a discussion of the epidemiology of use, background of massage therapy, evidence for effectiveness, and concerns for risk. A discussion of ongoing areas of research is included, as well as methods of identifying an experienced massage practitioner and communicating with patients.

## Data Sources

A search of MEDLINE and CINAHL databases was the primary method to identify articles to include in this review. The MEDLINE database included the Cochrane Database of Systematic Reviews. References were also collected from the articles retrieved. Searches also included Web sites of the National Cancer Institute ([www.cancer.gov/cancerinfo/treatment/cam](http://www.cancer.gov/cancerinfo/treatment/cam)), the massage research database maintained by the American Massage Therapy Association (<http://www.amtafoundation.org/researchdb.html>), and the database maintained by the Touch Research Institutes (<http://www.miami.edu/touch-research/>). The latest date of comprehensive database review was January 3, 2005.

## Article Selection

The MeSH search terms “massage therapy” and “neoplasm” were used to identify potential articles in the databases. All English language articles, including original research, letters and case reports, and review articles were included for review. Animal studies were excluded, as were articles focusing on solely on reflexology, prostatic massage, or other topics unrelated to the current topic of massage and cancer.

## Data Extraction

This review was not designed as a meta-analysis but rather as an academic topic review. The author read all articles, and salient information was abstracted to provide the material to construct this article. References in the retrieved articles were also reviewed, although

these references were not reviewed comprehensively or systematically.

## Results of Data Synthesis

### *Background and physiological effects of Massage Therapy*

Almost all cultures have developed massage therapy since it seems instinctual to rub and press an area of muscular pain. References date back at least as far as 1600 BC. Hippocrates mentioned massage (around 400 BC), and massage was used and referenced as a medical therapy until the focus of medical care shifted to the biological sciences in the early 20th century. In the 1970s, massage in the United States found renewed interest, especially for athletes. Over the past 25 years, the therapeutic uses of massage have broadened, and research has sought to investigate its physical, physiological, and psychological effects.

Massage therapy can result in blood vessel dilatation, an increase in skin temperature, and a decrease in heart rate and relaxation of mind and body. Underlying mechanisms of action have been hypothesized, including a reduced lactic acid build-up in muscles, stimulation of healing of connective tissues, and increase in lymphatic and venous circulation, but good research to support these ideas is lacking.<sup>1</sup> Studies have found an acute increase in natural killer cell number and activity following massage, but the clinical importance to claims of increased immunity remains unproven.<sup>2,3</sup>

There are many different forms of massage (eg, Swedish, sports, deep tissue, neuromuscular, shiatsu). Most types of massage have the common intent of calming the patient and promoting generalized well-being, with different forms having slightly different styles. Certain massage techniques may be more appropriate than others for cancer patients, depending on specific symptoms and goals. As a comprehensive review of all massage techniques is not possible, the oncologist should work with a massage therapist skilled in treating patients with cancer (addressed later in this review). In general, massage therapy involves the application of combinations of specialized strokes, rubs, and pressures applied in varying intensity to the soft tissues of the body, tailored to the patient's particular situation. Professional massage therapists receive variable training, and family members, friends, and non-massage therapist healthcare providers can be trained to provide basic massage. Massage is usually applied with the patient lying on a table but also can be applied to a patient in a seated position.

Massage has been studied and used in patient populations with life-threatening illness. While most research is focused on patients with cancer, the use of massage in other conditions such as HIV has been investigated.<sup>2,4</sup> These studies were small, and they looked at psychosocial and immune parameters rather than disease outcomes.

### Situations With Potential for Massage-Related Adverse Events

| Condition  | Potential Harm  | Modification Necessary   |
|--|---|--|
| Coagulation disorder (low platelet count, warfarin, heparin, or aspirin therapy) | Bleeding (ranging from minor bruising to internal hemorrhaging) | Lighten pressure and avoid deep tissue massage                         |
| Metastatic cancer in bones   | Fracture  | Determine location of metastases and lighten pressure over those areas |
| Open wounds; radiation dermatitis  | Increased pain, infection                                       | Avoid massage directly over open or healing wounds or dermatitis       |

## Rationale for and Use of Massage Therapy in Oncology

Patients with cancer may suffer physical symptoms and psychological stress. Physical symptoms such as pain or early satiety may be due to the location of the tumor, while other symptoms, such as constipation or nausea, can result from the medications used to treat these symptoms. Patients who have undergone cancer treatment may have symptoms related to the treatment, such as postsurgical pain or lymphedema. The burden of psychological stress, anxiety, and depression in cancer patients cannot be overemphasized. Depression has been estimated to be 4 times more common in cancer patients compared with the general population.<sup>5</sup> Anxiety may worsen patients' perception of their physical symptoms or may lead to their overestimating the risks associated with treatments. Because of undertreated psychological symptoms, patients with cancer may not follow through with treatment recommendations or may report a higher severity of physical symptoms.

Massage therapy has been increasingly employed and investigated as a therapeutic intervention to reduce symptoms in cancer patients. Studies are typically small or poorly designed, however, making it difficult to draw firm conclusions.

Studies have shown that patients with cancer are increasingly drawn to massage therapy in attempt to alleviate symptoms.<sup>6,8</sup> In a study published in 2000, 26% of 453 surveyed adult patients at M.D.Anderson Cancer Center acknowledged using massage therapy.<sup>9</sup> In 2001, 20% of 100 patients seeking care at a private cancer center reported having received massage therapy,<sup>10</sup> while in a prospective study of 50 patients receiving radiation for prostate cancer, only 6% of patients reported receiving massage therapy.<sup>11</sup> In 2004, 60% of 169 hospices who responded to a survey reported that they offered complementary medicine services at their hospices, with massage therapy being the most commonly offered service (available at 83% of the hospices offering CAM therapies).<sup>12</sup> Despite the popularity and availability of massage therapy for patients with cancer, some patients and their family members remain unaware of the potential uses of massage as a therapy for symptom control.

Oncologists are aware that many patients use complementary therapies, including massage therapy, but

often do not discuss the use of these therapies with their patients.<sup>13,14</sup> It has been widely postulated that open discussion between physicians and patients about CAM therapies may result in an enhanced physician-patient relationship and encourage enhanced compliance with recommended treatments.

## Safety of Massage Therapy

Overall, therapeutic massage is widely considered to be safe, though adverse events have been reported. Healthy patients may experience bruising, swelling of massaged muscles, a temporary increase in muscular pain, or an allergic reaction to the lubricants used — absolute risk of these events is unknown. Pregnant women should avoid prolonged positioning on their back. Case reports have reported or theorized serious adverse events, including fractures and dislocations, internal hemorrhage, and hepatic hematoma,<sup>15</sup> dislodging of deep venous thrombosis and resultant embolism of the renal artery,<sup>16</sup> and displacement of a ureteral stent.<sup>17</sup> A recently published review of cases reported in the literature and randomized, controlled trials of massage therapy found that few reported adverse events.<sup>18</sup> Cancer patients may be at higher risk for these problems, requiring modification of technique to avoid them. Specific situations often encountered with cancer patients, the potential harm of massage in these situations, and suggestions on ways to decrease risk are listed in the Table. There has been no evidence that massage therapy can spread cancer, although direct pressure over a tumor is usually discouraged.

Certainly, massage should never be advocated as a substitute for potentially curative oncologic care. Health-care providers should also realize that while massage therapy can be safe for their patients with cancer, massage therapists may also suggest certain herbs or other complementary medicine therapies to their patients that may put the patient at risk. Additional information on this topic has been published elsewhere.<sup>19</sup>

## Benefits of Massage Therapy

Few studies have adequate numbers of patients to investigate efficacy of massage therapy for symptoms in can-

cer patients. Also, investigators have found large trials difficult to design and carry out; one report described unforeseen challenges including late-stage cancer patients being too ill to participate and healthcare providers withholding referrals to the study because of a bias against having their patients possibly randomized to the nonmassage therapy control group.<sup>20</sup> The search strategy used by the Cochrane collaborative group<sup>21</sup> yielded eight randomized, controlled clinical trials, with a total of only 357 patients. This meta-analysis of trials published prior to May 2002 investigated the use of massage to reduce symptoms in patients with cancer. The authors noted that a reduction in anxiety (19% to 32% in four studies; 207 patients) was most common, with less evidence for physical symptoms such as pain, which many studies did not measure. Only three studies with a total of 117 patients measured pain; a decrease was noted in just one study. Criticisms of these studies included the small number of subjects enrolled and the use of only standardized massages that did not allow the therapist to direct the massage based on the patient's specific situation. Similarly, only two studies (71 patients) demonstrated a reduction in nausea. Individual studies showed improvement in other common symptoms, such as sleep.<sup>21</sup>

A few randomized, controlled trials have been published since the meta-analysis. In the United Kingdom, Soden et al<sup>22</sup> randomized 42 hospice patients with cancer to receive massage, massage plus aromatherapy, or no intervention over a 4-week period. The authors did not find any significant benefits for pain, anxiety, or quality of life, although statistically significant improvements in sleep were seen in both massage groups, and a reduction in depression was noted in the massage-only group. Patients with higher initial levels of psychological distress had more response to the massage interventions. The largest study on massage for symptom reduction in cancer patients to date was published by Post-White et al<sup>23</sup> in 2003. This group randomized 230 cancer outpatients to receive a standardized massage, healing touch (an intervention whereby the practitioner is believed to modify a patient's energy fields by motion of his or her hands near or gently on the patient), or the presence of a staff member in the room in a crossover design. Each intervention was given weekly for 45 minutes for 4 weeks. Physiologic effects such as decreased heart rate and respirations were seen in all three groups. Massage therapy lowered pain (with a reduction in the use of nonsteroidal anti-inflammatory medications also noted) and anxiety, and therapeutic touch also lowered anxiety.<sup>24</sup>

A nonrandomized study of a simple 10-minute foot massage by nurses showed immediate benefits for pain, nausea, and anxiety in 87 hospitalized patients with cancer.<sup>24</sup> Though conclusions cannot be drawn without a control group, further study is warranted as this intervention would be relatively simple to deliver.

A large, retrospective, observational study was conducted of pre- and post-massage symptom scores of 1,290 in- and outpatients seen over a 3-year period at Memorial Sloan-Kettering Cancer Center. A total of 3,609 massages were delivered. An average 50% reduction in symptoms (ranging from 21% improvement for nausea to 52% for anxiety) was seen following massage. Follow-up surveys at 48 hours showed persistence of the benefit. Patients rated symptoms including pain, fatigue, anxiety, nausea, and depression on a 0 to 10 scale. For the symptom rated the highest on premessage assessment, improvement was 54%. Results were believed to be clinically significant and, although the study did not have a randomized design, it supports the use of massage in symptom control for patients with cancer.<sup>25</sup>

Massage also has been proposed to reduce stress and increase relaxation for caregivers of patients with cancer. This was investigated in a study that measured the effects of a 20-minute therapeutic back massage at three time points (preintervention, immediately postintervention, and 20 minutes postintervention) on 42 spouses of patients with cancer.<sup>26</sup> They were randomly assigned to either the control group or the massage group. Mood that was assessed at preintervention, immediately postintervention, and 20 minutes postintervention showed improvement postintervention in the massage group. Another trial assigned 36 caregivers of patients undergoing autologous hematopoietic stem cell transplant to receive two 30-minute massage sessions (13 participants), two 30-minute healing touch sessions (10 participants), or a 10-minute nurse visit (13 patients).<sup>27</sup> Anxiety, depression, and fatigue were reduced by a statistically significant amount in the massage group.

A specific massage technique, "manual lymphatic drainage" (MLD), has been utilized to decrease breast cancer-related lymphedema and is commonly used in combination with support/compression garments, skin care, and exercise. Despite widespread use, MLD has not been rigorously studied. An exhaustive Cochrane collaboration search<sup>28</sup> identified just two randomized studies. A randomized crossover design study specifically examined this technique in 31 women with breast cancer-related lymphedema and showed significantly reduced limb volume as well as symptoms such as pain and heaviness. Quality of life was positively affected and sleep was improved.<sup>29</sup> However, in a study of 42 women with mastectomy-related lymphedema comparing MLD along with compression garments vs compression garments alone, the addition of MLD did not offer additional improvement in lymphedema.<sup>30</sup>

Abdominal massage has been advocated to reduce constipation. A review of trials of massage for chronic constipation concluded that the numbers of patients studied was too small to make definitive statements on efficacy.<sup>31</sup> Massage has been promoted to improve immune function, but actual studies are small and inconclusive.<sup>32</sup>

Massage therapy is also commonly advocated for cancer patients to help promote postoperative wound healing and reduce scar tissue formation, as well as to help release metabolic waste by improving circulation. However, published trials of massage therapy for these indications were not found on MEDLINE. Future well-designed trials may consider assessing massage therapy for these indications.

In summary, the strongest evidence for the ability of massage therapy to decrease anxiety and distress is found in trials involving cancer patients. The ability of massage to decrease pain is likely, but the number of patients studied is small. The efficacy of massage on other symptoms associated with cancer as well as on the number of medications used for symptom control also warrants more study. If massage therapy is indeed beneficial in cancer patients, perhaps more care centers for patients with cancer will make massage therapy available.

## Ongoing Research

Information on current clinical trials involving massage and cancer can be found by searching the NIH CRISP database (<http://clinicaltrials.gov>). As of April 2005, seven studies investigating the effects of massage therapy in cancer patients that were listed on this site were funded by either the National Cancer Institute or the National Center for Complementary and Alternative Medicine. Six of the seven studies have pain and other physical and functional symptoms as the primary outcomes; one is investigating MLD for breast cancer-related lymphedema. Two studies are in pediatric cancer populations, and the remainder are studying adults. Two of the larger trials are discussed below.

One current NIH-funded multisite study attempting to definitively answer the role of massage in reducing pain in end stage cancer patients is the Reducing End-of-life Symptoms with Touch (REST) study. The study group, based at the University of Colorado Health Sciences Center, will enroll 440 patients with end stage cancer over a 3-year period and randomize patients to a 2-week intervention of thrice-weekly 30-minute moving touch massage visits by massage therapists experienced in working with cancer patients or 30-minute “nonmoving touch” visits. For “nonmoving touch” visits, a volunteer places his or her hands in 10 specific places on the patient’s body for 3 minutes each. Effect on pain is the primary outcome, with secondary outcomes including other physical and psychologic symptoms commonly experienced by cancer patients as well as the use of medications for symptom control. Enrollment is estimated to be complete in 2006. The NIH is also funding a study of massage therapy to reduce fatigue in patients with certain cancer types. This study (currently in analysis phase) randomized patients to massage, sham bodywork, or usual care and was based at the University of San Francisco. Final results are not yet available.

## Discussing the Use of Massage Therapy With Cancer Patients

Though cancer patients often use complementary medical therapies, including massage therapy, in conjunction with conventional treatment, many oncologists do not feel comfortable discussing CAM use with their patients. Although massage is generally safe, cancer patients, particularly those undergoing active treatment, are at higher risk for complications. The Hippocratic Oath charges physicians to “First, do no harm”; since massage therapy may put the patient at risk, the oncologist has a duty to discuss massage with patients. Certainly, the oncologist should ask patients not only about massage but also about any other CAM therapies they are using and, at the very least, discourage the use of harmful therapies. A discussion of physician-patient communication regarding CAM therapies is available elsewhere.<sup>33</sup>

If a patient acknowledges using massage therapy, the oncologist should note any comorbid conditions (eg, anticoagulant use, heart failure, deep venous thrombosis, cellulitis, the presence of catheters, pregnancy, bone metastases) that may put the patient at higher risk for complications. If any of these comorbidities are present, the patient should be advised to work with a therapist experienced in medical massage or cancer massage who can incorporate appropriate modifications in technique to decrease risk. In addition, patients should be encouraged to consider the use of massage therapy for adjunctive management of pain and anxiety. If a patient is interested in using massage therapy, the physician should help in locating a qualified therapist.

## Finding a Qualified Massage Therapist

Variations exist in the philosophy and education of therapists, with some massage therapists under the mistaken belief that cancer is a contraindication for massage and others perhaps discouraging patients from receiving either potentially curative conventional care or potentially harmful therapies. Thus, finding a massage therapist experienced and comfortable with both cancer patients and the conventional care commonly used is paramount.

Oncologists can help patients find a qualified massage therapist. Given that many cancer centers, hospitals, and hospices now have integrative medicine programs offering massage therapy, oncologists can ideally refer patients to seek treatment in these settings. If such programs are not available, oncologists should encourage their patients to interview potential therapists or do so themselves to establish an ongoing consultant relationship for future referrals.

When interviewing a potential massage therapist, ask about education, experience, licensing, and certification. Consider only those with a minimum of 500 hours of

training. Massage therapy schools voluntarily meeting criteria set by the Commission on Massage Therapy Accreditation have achieved and maintained a level of quality, performance, and integrity that meets meaningful standards. A directory of accredited programs is available on the Commission's Web site (<http://www.comta.org/Home.htm>). Specialized programs for advanced training in massage care of the patient with cancer are also available. Additional education and experience in working with cancer patients is a must, but specialized programs are not standardized, and not all states regulate massage therapists. A current list is available from the American Massage Therapy Association Web site (<http://www.amtamassage.org/about/lawstate.html>). If a therapist is licensed, the initials "LMT" (Licensed Massage Therapist) or "LMP" (Licensed Massage Practitioner) are used after the therapist's name. In nonlicensing states, a therapist should have "CMT" (Certified Massage Therapist) as a minimum qualification. Beyond this, the initials "NCTMB" indicate that the therapist has voluntarily taken and passed an examination given by the National Certification Board of Therapeutic Massage and Bodywork.

The right massage therapist will be knowledgeable about risks and benefits of massage in a cancer population and should be comfortable communicating with the referring physician on an ongoing basis. They should see themselves as an extension of the patient's healthcare team, not as a replacement. Some massage therapists may have experience with other complementary therapies and should agree to encourage the patient to discuss any suggestions on other therapies with their oncologist.

The cost of massage therapy visits, while relatively minimal when compared with the cost of some medications and other conventional treatments for symptom control, may be prohibitive for some patients as it is often not covered by insurance. There may be funds available for patients through charitable organizations, and this option should be explored. The cost of massage therapy will typically qualify for reimbursement through medical flexible spending accounts and usually will count toward medical expenses that can be itemized on federal taxes. Patients should be encouraged to verify this with their employer and/or tax accountant or attorney. A relatively new and intriguing area of research in massage therapy is exploring the idea of teaching caregivers to massage patients undergoing cancer treatment. If this approach can be shown to be feasible and effective in terms of reduced symptoms in cancer patients, it will present a more cost-effective and convenient approach.

## Conclusions

Over 20% of patients with cancer use massage therapy, with most patients using massage and other complementary therapies along with conventional treatments.

Though physicians increasingly recognize that patients use complementary therapies, many are reluctant to raise the subject with their patients. Discussion of CAM treatments with patients may enhance the physician-patient relationship, improve compliance with conventional treatments, and allow the physician to promote nonpharmacological approaches to symptom management.

Information gathered from research studies suggests that massage should be promoted to cancer patients as a therapy to help reduce stress and anxiety. While the role of massage therapy to reduce symptoms other than anxiety has not yet been conclusively demonstrated, the low likelihood of harm, combined with studies that suggest a benefit for pain and other symptoms, makes massage therapy an attractive adjunct to conventional care. Massage should not be used as a substitute for conventional cancer care, and oncologists should recognize and discuss that massage practitioners may promote other potentially harmful unconventional therapies. Massage therapy should be accepted and condoned as a potentially beneficial intervention for symptomatic relief in patients with cancer, and it can be safely incorporated into conventional care of cancer patients.

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