



## Assessment of the current evidence on the affects of massage on cancer patients.



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**Date:** Published January 2020

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January 2020



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Amanda Winwood,

## Forward

The Made for Life Foundation (registered charity 1138846) was founded in 2010 to help people living with cancer get access to wellbeing support. With its roots in Cornwall, the charity has grown and has now supported well over 10,000 people across the UK since its creation. A primary focus of the Made for Life Foundation has been to ensure that spas open their doors to people with cancer allowing them to access the same well being services as people who have not lived with cancer.

It emerged in 2016 that 96% of spas in the UK were not accepting anyone diagnosed, receiving treatment, recovering or in remission from cancer. Many spas were insisting on a Doctor's note before accepting people visiting or receiving any treatments. Furthermore, in Colleges across the UK, massage therapists were being educated that cancer is contraindicated (suggesting the therapy should not be used with cancer patients) and people living with cancer should not be allowed any form of massage therapy. Instead they should be offered a manicure or pedicure.

Extensive research, working with advisors from MacMillan, the oncology team at the Royal Cornwall Hospital and the Mermaid Breast Cancer unit in Cornwall, led to the development of an accredited, endorsed and globally insured three day Cancer Touch Therapy™ training course. To date, the Foundation has trained over 1,200 therapists across the UK to be able to confidently welcome those going through cancer to have access to wellness support. Our feedback from the many people living with cancer who have received Cancer Touch Therapy™ treatments has been consistently positive.

Our mission is to change from 96% of Spas not allowing people touched by cancer to acceptance at 100% of spas across the UK to anyone at any stage of the cancer journey.

This research document forms part of this aim - to dispel the fear and enable people to access spa treatments that can improve health - physically and psychologically - and well being. We would like to thank all those involved.

Amanda Winwood, Founder, Made for Life Foundation

## Introduction

Cancer is a global health problem. In 2018 18.1 million people worldwide suffered from cancer (Cancer Today). This figure is expected to rise to 29.5 million people in 2040<sup>1</sup>. 9.6 million deaths were attributed to cancer in 2018, making it the second leading cause of mortality worldwide<sup>2,1</sup>.

Despite advances in medical treatment, cancer sufferers must contend with a variety of life-altering symptoms as a result of the cancer itself and/or its associated, often aggressive treatments used to treat it. Patients suffer side effects, often for long periods, with symptoms that include, but are not limited to, pain, fatigue, anxiety, depression and nausea<sup>3</sup>. In addition, the improved outcomes of treatments means that cancer patients are living longer (in remission) and therefore wanting to lead full lives in line with other members of the public.

Patients may turn to Complementary Medical Treatment (CAM), to manage their cancer in addition to the conventional medical treatments they are undergoing. CAM's can be defined as medical products and practices that are not part of standard medical care<sup>4</sup>. Examples of CAM include mind-body treatment (meditation, hypnosis, yoga, arts), biologically based practices (vitamins, herbs, dietary regimes), body-based practices (massage, reflexology, chiropractic care) and energy medicines (Tai-Chi, Reiki, therapeutic touch). Patients may choose to include CAM's as part of their medical care for many reasons, including as a form of self-expression, to develop autonomy over medical decisions, to be actively participating in their own health care, as a non-toxic treatment and to create hope<sup>5,6</sup>. Patients have the perception that CAM can prolong life, improve immunity, enhance their Quality Of Life (QOL) and relieve symptoms and side effects<sup>7,5,6</sup>.

Massage Therapy (MT) is an ancient practice involving the manipulation of the soft tissues of the body via the use of rubs and strokes of varying intensities and pressures. The type, intensity and pressure of the MT can be tailored to the individual's wishes and health status. Types of massage offered to cancer patients include Swedish massage, healing touch, reflexology and aromatherapy.

It has been demonstrated in a variety of studies that MT can relieve symptoms experienced by individuals with range of pathologies including, but not limited to; patients with arthritis, asthma, dementia, and cancer<sup>8</sup>. Studies have shown that massage is safe and can be effective in reducing the prevalence and/or severity of many of the symptoms experienced by a range of cancer sufferers, especially pain and anxiety. However, MT is currently underused in oncological settings in the UK compared to countries like the USA and Germany who are pioneering an integrative oncology (IO) approach to cancer treatment.

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- 2 World Health Organization Fact Sheets: Cancer. Available at: <https://www.who.int/news-room/fact-sheets/detail/cancer>. Accessed: 29/12/19.
- 3 Cassileth BR and Vickers AJ (2004) Massage therapy for symptom control: outcome study at a major cancer center. *J. Pain Symptom Manag*; 28(3): 244–9.
- 4 National Institutes of Health National Cancer Institute. Complementary and Alternative Medicine. Available at: <https://www.cancer.gov/about-cancer/treatment/cam>. Accessed: 17/12/19.
- 5 Richardson MA, Måsse LC, Nanny K, Sanders C (2004) Discrepant views of oncologists and cancer patients on complementary/alternative medicine. *Support Care Cancer*; 12(11): 797-804.
- 6 Kim DY, Kim BS, Lee KH, Lee MA, Hong YS, Shin SW, Lee SN (2008) Discrepant views of Korean medical oncologists and cancer patients on complementary and alternative medicine. *Cancer Res Treat*; 40(2): 87-92.
- 7 Savas P, Robertson A, Beatty L, Hookings E, McGee M, Marker J, McCaleb B, Bowen J, Richards A, Koczwara B (2016) Patient preferences on the integration of complementary therapy with conventional cancer care. *Asia Pac J Clin Oncol*; 12(2): 311-318.

## Use of Massage for Cancer Sufferers: UK and Worldwide

Individuals who have or are in remission from cancer are often refused MT at private clinics or spas. The general view amongst cancer charities and the massage industry is that no part of the individual, even regions not associated with the tumour site, should be massaged. This is despite no evidential basis demonstrating that MT is harmful or would generate undesirable side effects to cancer patients. Studies report that there have been no serious adverse effects related to massage intervention, including in patients with advanced cancer<sup>9,10</sup>. Any adverse effects or events observed during studies are attributable to the underlying medical diagnoses and not the MT<sup>9,10</sup>. MT is considered safe when performed by an experienced massage therapist<sup>11</sup>. Avoiding deep pressure on areas of soreness and sensitivity is encouraged in all MT, regardless of the client and any medical treatment they have received. If patients are less amenable to MT, localised massage such as hand and foot reflexology or light touch therapies are viable options that provide relief from various cancer-related symptoms.

Although it is thought that cancer patients' use of CAMs has increased over recent decades, reliable information on the prevalence of MT in oncology settings is not readily available<sup>12</sup>. Literature is inconsistent in what constitutes CAM and as a result, figures on the use and demand for CAM vary significantly across the literature, even for studies conducted in the same country. The prevalence of CAM use is significantly greater in North America compared to that of Europe<sup>12</sup>. Unsurprisingly, with the higher usage it must be acknowledged that the majority of reliable studies also come from the USA, and comparably research on CAM use in Europe is sparse.

In the UK, CAM therapies are not ordinarily provided by the NHS. Instead, treatments are provided by charities, such as hospices, or arranged privately, often in association with local NHS Trusts through referral<sup>13</sup>. Like many complimentary therapies across the NHS, CAM services are subject to insufficient funding and as a result, these services often require a financial outlay by the patient. In the UK, where much of the public is accustomed to free healthcare, having to pay for CAM can deter patients from accessing CAM therapies.

Massage can be offered by 42% of CAM units in the UK, whereas, in the US, an insurance based model for payment of medical care, massage is offered by 73% of National Cancer Institute-designated Comprehensive Cancer Centers<sup>13,14</sup>. This highlights the poor availability of MT for cancer patients in the UK. When MT is offered to cancer patients in the UK, utilisation of the service is extremely low. A study in a UK conventional cancer centre showed that 16%

- 8 Field T (2016) Massage therapy research review. *Complement Ther Clin Pract*; 24: 19-31.
- 9 Toth M, Marcantonio ER, Davis RB, Walton T, Kahn JR, Phillips RS (2013) Massage Therapy for Patients with Metastatic Cancer: A Pilot Randomized Controlled Trial. *Journal of Alternative and Complementary Medicine*; 19:7.
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- 13 Egan B, Gage H, Hood J, Poole K, McDowell C, Maguire G, Storey L (2012) Availability of complementary and alternative medicine for people with cancer in the British National Health Service: results of a national survey. *Complement Ther Clin Pract*; 18(2): 75-80.
- 14 Yun H, Sun L, Mao JJ (2017) Growth of Integrative Medicine at Leading Cancer Centers Between 2009 and 2016: A Systematic Analysis of NCI-Designated Comprehensive Cancer Center Websites. *J Natl Cancer Inst Monogr*; 52.

of outpatients visited the associated CAM unit, with only 9% of these outpatients actually accessing a therapy<sup>15</sup>. Of the group who accessed a therapy, 8% received MT<sup>15</sup>. Thus, it can be concluded that MT was accessed by less than 0.1% of cancer patients who had access to the therapy.

Visitors to the CAM unit were more likely to be young females with specific types of cancer, as well as living locally to the centre<sup>15</sup>. Specifically, it is known that individuals with breast cancer, of which over 99% of cases are female, are more likely to pursue CAM treatments than other patients, and in general females are 5 times more likely to approach CAM than males<sup>16,17,18</sup>. This is despite the fact that the incidence of and susceptibility of developing cancer is greater in males than females<sup>19</sup>. The result of the apparent inequalities in patients accessing CAM therapies is that there is a large demographic of patients who are not exposed to the potential symptom relief and well being benefits provided by MT.

For patients in ill-health, the ability to travel to CAM centres, and having the time to access therapies have been cited as major issues which can impede patients from accessing MT<sup>20</sup>. Communication between conventional medicine clinicians and the patient also forms a major barrier to the use of CAM in cancer patients. Patients are most commonly informed about CAM therapies from friends, family and the media, and it is the patient who initiates discussions about CAM in over 90% of cases<sup>21,5</sup>. The attitudes of the physicians can lead patients to believe that they would discourage or disapprove of CAM use, or that in the worst case, the physician may discontinue conventional medical treatment if they disclosed their use of CAM<sup>5</sup>. Clinicians rarely encourage patients to use CAM. Indeed, one study at a US cancer centre reported that only 15% of clinicians encouraged patients to use CAM<sup>5</sup>. More often, clinicians were neutral, however studies from other nations report that oncologists will warn patients of the risks of CAM use or actively discourage patients from using CAM<sup>5,6,22</sup>. Other reasons for lack of disclosure include that it was not important for the physician to know, the physician never asked or that the patient is unsure of the benefit of the CAM treatment<sup>5,6</sup>. As a result, patients often do not disclose their use of CAM to conventional medicine physicians. Numerous studies confirm that physicians and nurses trained in conventional medicine lack adequate knowledge on CAM use in oncological settings<sup>23,24</sup>. Improving oncology treatment provider education on CAM therapies is essential

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- 16 Luo Q and Asher GN (2017) Complementary and Alternative Medicine Use at a Comprehensive Cancer Center. *Integr Cancer Ther*; 16(1): 104-109.
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- 5 Richardson MA, Mässe LC, Nanny K, Sanders C (2004) Discrepant views of oncologists and cancer patients on complementary/alternative medicine. *Support Care Cancer*; 12(11): 797-804.
- 6 Kim DY, Kim BS, Lee KH, Lee MA, Hong YS, Shin SW, Lee SN (2008) Discrepant views of Korean medical oncologists and cancer patients on complementary and alternative medicine. *Cancer Res Treat*; 40(2): 87-92.
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- 25 Grant SJ, Hunter J, Seely S, Balneaves LG, Rossi E, Bao T (2019) Integrative Oncology: International Perspectives. *Integr Cancer Ther*; 18(11): 1-11.

to improve patient-clinician communication and allow clinicians to accurately advise patients on the benefits of CAM in conjunction with conventional medical care. As a result of the poor communication between patient and clinician, the perceived demand for CAM services in the UK is low. It is unlikely that the current state of CAM use in the UK accurately reflects the cancer patients' use and want for CAM services.

Integrated Oncology (IO) is a novel approach to cancer treatment that aims to improve a patient's health outcomes through the unity of conventional pharmacological medicine and non-pharmacological CAM. MT is included as part of a holistic treatment plan that, by its nature, can address more of a patient's health and well being needs. A concept pioneered by the USA, The Society for Integrative Oncology (SIO) was formed as the first IO organisation worldwide in 2003. Other nations subsequently formed IO organisations, including the British Society for Integrative Oncology (UK) and Competence Network for Complementary Medicine in Oncology (Germany) . Work has also been done in Australia<sup>26</sup>. There is currently no international governing body which regulates the use of IO in cancer patients, however the SIO can be considered the world's leading organisation for promoting use of IO practices and is the only society worldwide to make a formal recommendation for the use of MT for cancer patients<sup>27</sup>. Specifically, the SIO recommends the use of massage for reducing anxiety and improving mood disturbances during and after breast cancer treatment (Lyman et al., 2018). This has been endorsed by the American Society of Clinical Oncology. This recommendation reflects the positive outcomes from the majority of studies evaluating the use of oncology massage, most of which have been performed in breast cancer patients.

Leading IO centres include The University of Texas MD Anderson Cancer Center (USA), the Memorial Sloan Kettering Cancer Center (USA), the Kliniken Essen-Mitte (Germany) and Centre for Health Research (Australia). A typical IO service within these institutions involves the collaboration of an integrative medicine team and conventional clinicians, who together work with the patient to develop an appropriate treatment plan that is individualised and relevant to each the patient's health status<sup>25</sup>. When included as part of an IO programme, massage was the most popular therapy at integrative medicine department in a US hospital, making up over 55% of outpatient appointments<sup>28</sup>. Therefore, it can be suggested that uptake of MT, and CAM services in general, is much greater in an environment where CAMs are accepted and perceived positively. The barrier associated with patient-clinician communication is overcome through the active discussion and understanding of the benefits associated from the use of CAM by medical professionals.

Integration of CAM with conventional medicine can reduce the severity of cancer associated symptoms<sup>29</sup>. By administering MT in chemotherapy suites (ie. patients receive MT while receiving chemotherapy drugs), issues surrounding the lack of time for MT and travel to a separate CAM centre are overcome. IO may also be economically favourable compared to conventional medical care, as it has been documented that patients being treated with an IO approach require significantly less medication than patients treated with conventional medicine<sup>30</sup>. Even with initial start-up costs and the most conservative estimates of savings, decreased medication costs were sufficient to create savings for the hospital in the second year of the programme.

25. Grant SJ, Hunter J, Seely S, Balneaves LG, Rossi E, Bao T (2019) Integrative Oncology: International Perspectives. *Integr Cancer Ther*; 18(11): 1-11
26. Smith C, Hunter J, Ussher KM, Delaney G, Grant S, Templeman K, Parton C, Kellett A (2017) Integrative Oncology in Australia 2016: Mapping Service Provision and Exploring Unmet Needs. Penrith, N.S.W.: Western Sydney University. doi:10.4225/35/5977cde41bd1c
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## Benefits of Massage for Cancer Patients

Cancer patients experience symptoms as a result of cancer itself, due to treatments and during cancer remission. There is an abundance of evidence demonstrating that MT can alleviate symptoms of both cancer and its associated treatments and produce measurable positive effects on both physical and mental health. An observational study of 1,290 patients revealed that scores for all surveyed symptoms improved by more than 40% after massage<sup>31</sup>. There are a number of factors involved in maximising the symptom relief that MT can provide. The personal aspect of MT appears to be important, as symptoms improved to a greater extent in patients treated by the same therapist compared to patients treated differently by therapists during the intervention period<sup>32</sup>. In addition, significant improvements in scores are observed with subsequent treatments, suggesting therapy should be continued over numerous sessions.

### Mood

A meta-analysis has shown that the prevalence of anxiety disorders in oncological settings is 10%, compared to a global prevalence of 7%<sup>33,34</sup>.

Major and minor depression is prevalent in 15% and 20% of patients respectively, (16% overall)<sup>35</sup>. This is compared to a global prevalence of 4%<sup>36</sup>.

The prevalence of anxiety and depression experienced by cancer patients are not evenly distributed within cancer population, varying by age, gender and cancer type<sup>37</sup>. The prevalence of both anxiety and depression is greater in women compared to men. It should also be noted that no matter what type of cancer, women and people younger than 50 showed subclinical or clinical levels of anxiety in over half of cases.

Of all the symptoms experienced by cancer sufferers, anxiety is the symptom that is most frequently rated the highest pre-massage, followed by pain and fatigue<sup>38</sup>. However, anxiety saw the greatest improvement post-massage, with 52% improvement in pre-massage anxiety scores. This suggests that symptoms with the highest baseline score have the greatest potential to be alleviated with MT.

31. Cassileth BR and Vickers AJ (2004) Massage therapy for symptom control: outcome study at a major cancer center. *J. Pain Symptom Manag*; 28(3): 244-9
32. Listing M, Reibhauer A, Krohn M, Voigt B, Tjahono G, Becker J, Klapp BF, RauchfuB M (2009) Massage therapy reduces physical discomfort and improves mood disturbances in women with breast cancer. *Psycho-Oncology*; 18: 1290-1299
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38. Cassileth BR and Vickers AJ (2004) Massage therapy for symptom control: outcome study at a major cancer center. *J. Pain Symptom Manag*; 28(3): 244-9
39. Post-White J, Kinney ME, Savik K, Gau JB, Wilcox C, Lerner I. (2003) Therapeutic massage and healing touch improve symptoms in cancer. *Integr Cancer Ther*; 2(4): 332-344

MT is associated with significantly lower levels of anxiety in outpatients undergoing chemotherapy<sup>39</sup>. Furthermore, an IO trial in which women with breast cancer received MT at the same time as they were receiving chemotherapy drugs reported a significant decrease in anxiety<sup>40</sup>. Similar results are reported in inpatients. Foot reflexology can reduce anxiety in hospitalised patients with lung or breast cancer<sup>41</sup>. Healing touch can also alleviate anxiety, demonstrating that deep pressure is not always required for relief from cancer symptoms<sup>39</sup>.

It is well known that various aspects of mood can be modulated by MT. For example, depressed mood, anger and vigour scores were improved in a group receiving MT, and to a greater extent than a group receiving relaxation therapy<sup>42</sup>. In patients with advanced cancer, MT was associated with statistically significant reductions in depression scores after the second massage session<sup>43</sup>.

Improving mood in cancer patients not only has the potential to improve quality of life (QOL), but can improve clinical outcomes. There is a body of evidence that suggests that poorer mood and mental health are associated with poorer clinical outcomes. In breast cancer patients, significantly higher levels of anxiety and depression are associated with post-operative complications, higher analgesic consumption and a greater intensity of post-operative pain<sup>44,45</sup>. Anxiety and depression scores that are classified as abnormal have been linked to longer hospital stays than individuals with scores that are classified as normal<sup>44</sup>. Thus, improving mood through the use of MT has the potential to produce numerous benefits for both cancer patients and health care providers. These studies highlight the intrinsic link between physical and mental health that is often overlooked within current medical systems and treatments. As cancer is a physical disease, psychological symptoms are often overlooked. However, symptoms do not exist in isolation and to address cancer symptoms more effectively, we must view health holistically, considering the effects of cancer on both the physical and mental states and the “battle” waged against it needing to take place on both fronts to have the best chance of success.

### Pain

Pain is a common and burdensome symptom experienced by individuals with cancer. The prevalence of pain amongst cancer patients is reported to be 55% during cancer treatment, 66% in advanced, metastatic or terminal disease and 39% after curative treatment<sup>46</sup>. These results are indicative of the high prevalence of pain experienced by cancer patients in all stages of the disease, and suggest that current pain relief strategies for cancer patients are insufficient. Note: a similar study conducted 9 years prior produced results that are little different to those produced more recently<sup>47</sup>. Thus, despite the significant impact pain can have in compromising

an individual's QOL, it is evident that there has been a lack of progression in our ability to treat cancer-related pain.

Pain is a particularly life-altering symptom because in addition to the effects of pain itself, pain can impact psychological wellbeing. One study found that women with persistent post-mastectomy pain showed elevated levels of distress related symptoms such as anxiety, depression and sleep disturbances, compared to women without pain<sup>48</sup>.

Studies across a range of cancer types, stages and treatment settings have found statistically significant improvements in pain with massage therapy in both within-subject and inter-subject tests. Indeed, a meta-analysis concluded that MT significantly reduced cancer pain compared with no massage treatment or conventional medical care<sup>49</sup>. This is supported by results from a large study at a cancer centre which showed that MT reduced pain measures by 40%<sup>50</sup>. Similarly, a smaller study in a hospice reported a 42% decrease in pain intensity immediately after MT, which is significantly greater than the change seen in the control group<sup>51</sup>. Specifically, reductions in physical discomfort, bodily pain, pain of the limbs and breast symptoms were experienced by women with breast cancer after MT compared to the control group. While many studies report improvements in symptoms immediately after MT, this study showed that the significant reduction in physical discomfort experienced by women with breast cancer at the end of the 5 week intervention was sustained at a follow up 6 weeks post-intervention (Listing et al., 2009) demonstrating the long lasting efficacy of such interventions<sup>52</sup>.

MT can also alleviate pain experienced as patients are undergoing therapy to treat the cancer. Significant reductions in pain were experienced post-MT in inpatients undergoing chemotherapy or radiotherapy, and in outpatients undergoing chemotherapy<sup>53,54</sup>.

### Other symptoms

Symptom improvements are not limited to mood and pain. In patients with metastatic bone cancer, significant improvements in sleep quality and muscle relaxation, as well as pain and mood, were present post-massage relative to pre-massage<sup>55</sup>. Sleep scores were also improved with MT and aromatherapy massage in a small study of individuals with advanced cancer. Improvements in dyspnea (shortness of breath) and physical functioning (a measure including exercise and general activities) with foot reflexology have also been shown in breast cancer patients<sup>56</sup>.

40. Mao JJ, Wagner KE, Seluzicki CM, Hugo A, Galindez LK, Sheaffer H, Fox KR (2017) Integrating Oncology Massage Into Chemoinfusion Suites: A Program Evaluation. *J Oncol Pract*; 13(3): 207-216.

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Nausea is a common symptom experienced during chemotherapy. Evidence suggests that MT has been can diminish the incidence and severity chemotherapy-associated nausea in children and adults<sup>57,58,59</sup>.

Fatigue is another common symptom experienced across various stages of cancer. MT has been shown to relieve fatigue when performed in patients undergoing chemotherapy<sup>57</sup>. Correspondingly, MT is associated with a reduction in fatigue and a concurrent increase in the QOL of cancer survivors<sup>60</sup>. This result is of even greater importance when it is considered that the control group experienced either no change or a significant increase in fatigue scores and a decrease in QOL.

### Advanced cancer

Advanced cancer is associated with a high prevalence of symptoms. A study in over 700 people with stage 3 cancer or above showed that 77% suffered from pain and over 90% suffered from tiredness, disturbed sleep, feelings of sadness and worry<sup>61</sup>. Significant improvements in pain and mood are seen in patients with advanced cancer with massage and simple touch therapies, respectively, immediately after the treatments<sup>62</sup>. Crucially, both therapies were associated with significant improvements in the QOL of patients. Massage produced a significantly greater improvement in both pain and mood than simple touch. This may reflect the lack of meaningful contact received by patients with advanced cancer due to fears of causing pain or interfering with treatment. These studies support the use of massage in palliative care as both safe and efficacious in reducing symptoms.

### Physiological responses

The improvements in physical and mental symptoms are reflected in physiological responses to MT. Indeed, in patients undergoing chemotherapy, both massage and healing touch are associated with significantly decreased blood pressure, respiratory rate and heart rate in comparison to the control group<sup>63</sup>. Comparable results are shown in a hospice setting, in which patients with advanced cancer experienced significant decreases in heart and respiratory rate post-massage<sup>64</sup>.

Immune status can also be influenced by massage. In women diagnosed with early stage breast cancer, Natural Killer (NK) cells and lymphocytes increased over a 5-week period of MT<sup>65</sup>. In contrast, the control group saw a decrease in the number of NK cells. NK cells are known to act as immunoregulatory cells and possess anti-tumour activity<sup>66</sup>. Therefore, MT can act to prevent the deterioration of immune status<sup>65</sup>.

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### Lymphedema and Manual Lymph Drainage

Lymphedema is a common condition than develops following breast cancer treatment specifically Breast Cancer Related Lymphedema (BCRL) and is characterised by the accumulation of lymph in the interstitial space. The main causes of lymphedema are infiltration of tumour cells into the lymph system, surgery to remove the lymph nodes or radiotherapy, all of which disrupt the flow of lymph<sup>67,68</sup>. This can result in swelling of the area around the arm and shoulder, pain and reduced mobility<sup>67</sup>. Women with lymphedema have significantly lower health-related QOL compared to breast cancer survivors without lymphedema<sup>67</sup>.

Manual lymphatic drainage (MLD) is a specialised massage technique designed to reduce oedema of the lymph nodes. MLD is unlike other MT in that it involves the skin surface only (Martín et al., 2011). The technique aims to decongest the lymph vessels and facilitate the drainage of the fluid from the lymph nodes<sup>67</sup>.

Although MLD is considered safe for cancer patients, the evidence surrounding the efficacy of MLD for reducing the incidence of BCRL is mixed and contradictory<sup>69</sup>. It can be suggested that MLD is an effective treatment for BCRL when commenced immediately after surgery. Women who receive MLD immediately after surgery did not experience BCRL 6 months post-operation, while the control group saw a statistically significant increase in arm volume at the same 6 month follow up<sup>70</sup>. In contrast, MLD was deemed an ineffective treatment for BCRL at a 6 month follow up in a study which did not commence MLD until 5-weeks post-surgery, suggesting the period in the weeks immediately after surgery is a critical time for targeting BCRL<sup>71</sup>.

Evidence suggests that combination of physical therapy and MLD can be an effective treatment for BCRL. The incidence of lymphedema was significantly lower in groups receiving MLD and physiotherapy compared groups receiving solely physiotherapy or an educational strategy<sup>72,73</sup>. In addition, significant decreases in pain scores were observed<sup>74</sup>. In a large randomised, controlled study of 1,000 patients, self-MLD combined with exercise was associated with a significant improvement in scar contracture, shoulder abduction and upper limb lymphedema compared to exercise only. The low availability of therapists trained in MLD has previously limited the size of trials, thus the use of self-MLD allows for larger studies to be carried out. However, it must be acknowledged that it cannot be guaranteed that individuals are performing the technique correctly. Despite this, the positive results of this trial suggest that a form of touch and pressure on the affected area is enough to alleviate BCRL, and also improve scar healing.

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It can be concluded that MLD can be an effective therapy for reducing the prevalence of BCRL and associated symptoms when commenced early post-operation and used in conjunction to physical therapies even if carried out by the patient themselves.

### Scar tissue

Scar tissue forms as part of the biological healing processing following injury to the body's tissues. Scar tissue, which is made of collagen fibres, replaces the damaged tissues. Within sports, scar massage is commonly recommended for breakdown of scar tissue through breaking down the collagen fibres, which are less elastic than other tissues<sup>75</sup>. In addition, scar massage is recommended as a form of post-operative scar management by some NHS trusts. In patients with hypertrophic burns scarring, scar massage can decrease scar height, vascularity, pain, pruritus (itchiness) and the prevalence of depression as well as increase pliability<sup>76</sup>.

Radiation-induced fibrosis (RIF) is a broad term that encapsulates a range of pathologies and symptoms produced as a result of radiation therapy. Although the aim of radiotherapy is to target rapidly dividing cancer cells, any healthy tissues within the treatment field can also be damaged on exposure to radiation. Radiation can induce localised inflammation, which subsequently develops into the fibrotic tissue associated with scarring<sup>77</sup>. All tissues within the treatment field can be subject to fibrosis, including the skin, subcutaneous tissues and organs. RIF is associated with a plethora of side effects depending on the site of radiation. These commonly include changes in the appearance of the skin, reduced tissue compliance, functional impairment and pain, all of which ultimately can have repercussions on QOL. Patients may also suffer from the development of hypersensitive scar tissue following surgeries such as mastectomies<sup>78</sup>. Scar tissue can cause side effects such as stiffness, pressure, nerve pain, numbness, an area that feels like a lump (suture granuloma) or changes in appearance (in the breast for example)<sup>79</sup>.

Despite the use of MT for the management of scar tissue in other areas, and the obvious need for scar management in cancer patients, research on the use of scar massage in cancer patients is scarce, and evidence mainly anecdotal. While deep friction massage has been shown to have relieved the symptoms of RIF, particularly in the thoracic intercostal muscles, the sample size of one person makes this result interesting but unreliable overall<sup>80</sup>. The use of Astym® treatment is also claimed to improve function and range of motion following mastectomy (Davies et al., 2016). As already discussed, self-MLD combined with exercise was associated with an improvement in scar contracture<sup>81</sup>.

Throughout oncology care, messages on the use of scar massage are mixed. While no medical body has made a clinical recommendation for the use of scar massage in cancer patients, some charities, such as the Breast Cancer Haven, offer scar massage<sup>82</sup>. Larger studies into the effects of MT on post-treatment scar healing in cancer patients represents a future research priority. Only then can medical bodies make evidence-based clinical recommendations.

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## Conclusions

For decades, studies have accumulated showing that massage can provide numerous benefits to the physical and mental states of cancer patients with no adverse effects. Improvements in anxiety, depression, pain, fatigue and nausea, to name a few, have been demonstrated by a range of studies. The benefits of MT have been shown in a range of cancer patients including individuals with early stage, metastatic and advanced cancers, as well as in individuals undergoing and recovering from treatment.

Furthermore, it has been demonstrated that MT can to improve clinical outcomes with potential benefits to the patient and health care provider. Despite this wealth of evidence, massage continues to be overlooked as a treatment for cancer patients and has yet to be put into mainstream clinical practice in the UK, and much of the world.

It is hoped that this review can educate policy makers, clinicians and patients as to the valuable benefits provided by MT to patients in both their physical and mental health and wellbeing.

Furthermore, the potential benefits to Health Care providers with constrained budgets has also been demonstrated.

An increased utilisation of MT from its current very low levels will deliver significantly improved outcomes for patients whilst at the same time reducing costs and resource needs for the providers across the UK.

There are numerous barriers that prevent patients from accessing MT. Major UK charities provide mixed and unclear messages surrounding the use of MT in cancer patients and this does nothing to dispel the various notions within the spa industry which currently prevent patients from receiving beneficial massage therapy.

Health care providers and charities must coordinate to provide evidence-based information on the safety and benefits of massage for cancer patients that is both consistent and of greater detail, allowing the patient to make an informed choice.

We must also address additional barriers to treatment including the issues surrounding the cost of treatments, having the time access treatment, the ability to travel to CAM centres, and poor patient-clinician communication. As discussed, adoption of an IO approach to cancer care can facilitate the removal of these barriers and change both the patient and clinicians' perceptions of MT.

The bias in the demographic of patients accessing MT must be changed, because it is this that currently limits the clinical recommendation of MT to all breast cancer sufferers.

A comprehensive evidence base of the effects of MT in non-breast cancer demographics is required in order form clinical recommendation for MT as a form of symptom relief for other cancer sufferers.

It is the responsibility of health care providers to efficiently manage the symptoms of cancer patients. The state of cancer care in the UK is unacceptable when it is considered that a large number of people suffer from cancer-associated life-altering symptoms that can be cost effectively addressed through simple education.

Steps should be taken to endorse the use of MT for cancer patients in the UK, with the goal of allowing MT to be recommended by medical professionals. Integration of non-pharmacological interventions including MT into mainstream medical practice throughout the UK would be a major step in improving care for cancer patients. Indeed, integrating massage into cancer treatment is a feasible, well-received and effective therapy for management of symptoms experienced during cancer treatment (Mao et al., 2017). Already established IO programs in the USA and Germany can provide models for the widespread development of IO programs in the UK. Formation of an international IO governing body is needed to facilitate the standardisation of practice, promote international cooperation and form clinical recommendations for the use of MT in cancer patients.

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