

# MANAGING SIDE EFFECTS OF CHEMOTHERAPY AND RADIATION

Patients with cancer undergo numerous conventional treatments: surgery, chemotherapy, radiation, and/or immunotherapy. These conventional treatments can cause many side effects, only some of which can be treated with medications. Others take time to resolve after the treatment is complete, but some do not resolve at all. The following summarizes the evidence-based integrative therapies and supplements available to prevent and treat the side effects of conventional treatments and symptoms of cancer.

**Note:** Please refer to the [Passport to Whole Health](#), Chapter 15 on Dietary Supplements for more information about how to determine whether or not a specific supplement is appropriate for a given individual. Supplements are not regulated with the same degree of oversight as medications, and it is important that clinicians keep this in mind. Products vary greatly in terms of accuracy of labeling, presence of adulterants, and the legitimacy of claims made by the manufacturer.

## FATIGUE

Fatigue is experienced by almost every patient undergoing cancer treatment. There are numerous contributing causes including anemia, nutritional deficiencies, endocrine dysfunction, cardiopulmonary dysfunction, mood disturbance, pain, sleep disturbance, deconditioning, treatment-related effects, and the underlying malignancy. The following therapeutic approaches are supported by recent studies:

- Aerobic exercise[1-4]
- Meditation and Mindfulness-Based Stress Reduction (MBSR)[5,6]
- Clinical hypnosis, Guided Imagery[6-8]
- Cognitive Behavioral Therapy[6,7]
- Energy therapies—healing touch, therapeutic touch[1,9]
- Acupuncture[5,10-12] (For more information, refer to [Passport to Whole Health](#) Chapter 18 on Chinese Medicine and Acupuncture.)
- Relaxation techniques[1]
- Massage[13]
- Yoga[14-17]
- Qigong and tai chi [18,19]
- L-carnitine up to 3 grams per day[20]

## PAIN

Cancer pain can be described as nociceptive or neuropathic. Nociceptive pain results from damage to tissue, while neuropathic pain is caused primarily by nerve injury. Unfortunately, despite the availability of various pain therapies, cancer pain is estimated to be moderate to severe in 50% of patients.[21] Potentially beneficial interventions include:

- Clinical hypnosis—especially preprocedural, and in particular for breast biopsy and during percutaneous tumor treatment; Guided Imagery[6,7,22,23]
- Music therapy[11,24-27]
- Acupuncture[10,22] (For more information, refer to [Passport to Whole Health](#) Chapter 18 on Chinese Medicine and Acupuncture.)
- Massage[13,22]
- Cognitive Behavioral Therapy (CBT)[6]
- Relaxation techniques[6]
- Meditation[6]
- Energy therapies—healing touch, therapeutic touch, Reiki[9,27]

Refer to the Whole Health overview “[Chronic Pain](#)” for a more detailed approach to pain management.

## DEPRESSION, ANXIETY, AND MENTAL HEALTH

Cancer is a difficult diagnosis to receive and the treatment can be prolonged. Many patients experience depression, anxiety, mental stress, and anguish at the time of diagnosis or during various stages of the treatment. Coping can be very difficult, and at times, medications are necessary.

Potentially beneficial approaches to consider specifically for people with cancer include:

- Counseling, therapy, and support groups [27]
- Meditation and MBSR[1,22,27-34]
- Music therapy[1,22,24,25,27]
- Massage[1,22,27,35]
- Yoga[1,16,27,36]
- Energy therapies[22]
- Relaxation techniques—progressive muscle relaxation, Guided Imagery[1,27]
- Clinical hypnosis[8]
- Qigong and tai chi[19]

Refer to “[Depression](#)” and “[Anxiety](#)” Whole Health overviews for more information on Whole Health approaches for these conditions.

## INSOMNIA

Quality of sleep is a major indicator of well-being. Sleep disturbances and lack of quality sleep occur in 30% to 75% of patients with cancer. Consider the following in cancer patients, as these show promise in the research:

- CBT[1,6]
- Meditation and MBSR[22]
- Yoga[15,16,22,27,37]
- Qigong and tai chi[19]
- Clinical hypnosis, Guided Imagery[6]

- Relaxation techniques[6]
- Melatonin 1-20 mg nightly as needed; start low and gradually increase dose as tolerated[38]

For more information, refer to the Whole Health overview “[Recharge.](#)”

## NEUROPATHY

Peripheral neuropathy is a potentially debilitating side effect caused by a number of chemotherapeutic agents, especially the platinum-based drugs and taxanes. Therapies that have shown potential benefit for neuropathy include the following:

- Exercise[39]
- Acupuncture[39-41] (For more information, refer to [Passport to Whole Health](#) Chapter 18 on Chinese Medicine and Acupuncture.)
- L-glutamine: 10 gm three times a day for the first 7 days of chemotherapy[20] or 10 gm 1-2 times a day for prevention and maintenance
- Vitamin E: 300 mg twice a day during and continued for 3 months after platinum- or taxane-based chemotherapy[20]

## ORAL MUCOSITIS

Mucositis is a common side effect of chemotherapy, local radiation, and bone marrow transplant, and is often the dose-limiting side effect for treatment. Mucositis involves inflammation and ulceration of the mucosal lining in the oral cavity, which causes pain, discomfort, and difficulty eating and swallowing, increasing the risk for hospitalization.

### TIPS FOR MUCOSITIS[43]

Mucositis is painful inflammation and ulceration of the lining of the digestive tract. To help with it, consider the following:

- Consume **soft, moist, mild foods** like fruit purees, soups, cooked cereals, pasta, and starchy vegetables.
- Try **cold foods** and drink through a **straw**.
- Maintain **good oral hygiene and rinse the mouth** frequently.
- Swish and swallow **aloe vera juice** a few times a day, and try drinking **slippery elm or marshmallow root tea**, for symptom relief. Topical application of 20 mL of pure honey 15 minutes before, 15 minutes after, and 6 hours after radiation therapy.[1]
- Sucking on **ice chips** 5 minutes before, during, and after 5-FU infusion.[43]

**Other supplement** to consider:

- **L-glutamine** can be used to prevent or treat oral mucositis[20]
  - Oral: 5-10 gm 2-3 times a day
  - Swish and swallow: 16-24 gm of L-glutamine used four times a day or more
- **Vitamin E** has shown mixed results[20]

- Swish a vitamin E oil containing 400 mg/mL around the oral cavity twice a day
- **Zinc** can be taken 25-50 mg three times a day during radiation to prevent or treat oral mucositis[20]
- **Traumeel**, a homeopathic remedy used as a mouthwash for chemotherapy patients, can be considered[20]
- **Proteolytic enzymes** containing papain, trypsin, and chymotrypsin taken three times a day from 3 days before until 5 days after radiation[20]

## XEROSTOMIA

Xerostomia is dry mouth caused by salivary gland damage due to head and neck radiation therapy. Decreased salivation can lead to dental caries, tooth decay, periodontal disease, inflammation, and ulceration, causing difficulty eating, swallowing, and speaking. Patients experience taste sensation changes, increased thirst, and tongue pain. Acute radiation-induced xerostomia is associated with an inflammatory reaction. Delayed radiation-induced xerostomia can occur up to one year after treatment from fibrosis of the salivary gland and is typically permanent.[1]

### TIPS FOR XEROSTOMIA[43]

1. Add sauces and oils to increase the **moisture content of food**. Consume blended and pureed foods, soups, and stews to ease swallowing. Thick, creamy, nutrient-rich liquids are recommended.
2. **Keep the mouth moist** by sucking on ice chips, ice pops, or hard candy. Drink liquids with meals.
3. Add **citric acid-containing foods** to the diet to stimulate saliva production, including oranges and lemons. (*Not* recommended if one has mucositis as well.)
4. **Avoid foods rough in texture or eaten at extreme temperatures** as this could worsen injury. Avoid very dry foods.
5. To minimize the risk of oral infection, **cleanse the palate** by swishing with a saline solution (1 qt water with  $\frac{3}{4}$  tsp salt and 1 tsp to 1 tbsp baking soda) before and after eating. Practice good oral hygiene.
6. **Acupuncture** may stimulate salivary production.[1,44,45] (For more information, refer to [Passport to Whole Health](#) Chapter 18 on Chinese Medicine and Acupuncture.)

## LYMPHEDEMA

Lymphedema is swelling that occurs in a limb. With breast cancer, it may occur postoperatively if lymph nodes are removed during surgery. It can occur months to years after treatment and is a chronic condition which can be managed but not cured. Numerous modalities can prevent lymphedema from occurring or reduce its progression.

- Massage and manual lymphatic drainage for treatment[4,27,35] (For more information, go to [Passport to Whole Health](#) Chapter 16 on massage.)

- Upper body exercise may help to prevent it[46,47]
- Selenium selenite: 1,000 mcg daily loading dose for first week, 300 mcg for the next 2 weeks, and then a maintenance dose of 100 mcg for 3 months[20]

## DIARRHEA

Inflammation of the mucous membranes in the mouth is often associated with disruption of the gut mucosa, leading to gastrointestinal toxicity, such as leaky gut or diarrhea. The degree of mucositis is directly correlated with the severity of intestinal permeability. Lactose intolerance also increases during chemotherapy.[20] Probiotics may prevent or reduce chemotherapy and radiation induced diarrhea and rarely cause severe adverse effects.[48,49]

### TIPS FOR DIARRHEA[43]

1. **Sip clear liquids** throughout the day to prevent dehydration.
2. **Eat small, frequent meals** and snacks throughout the day.
3. **Avoid greasy, fried, or spicy foods, caffeine, and chewing gum.** Avoid commercial fruit juices.
4. **Reduce fiber** intake temporarily.
5. Consume **bland foods** as part of the “BRAT” diet.
6. Increase intake of **potassium-containing foods**.
7. Consider **L-glutamine** 5-10 gm orally 2-3 times daily. Results are mixed.[20]
8. **Probiotics** 1-3 times daily, containing *Lactobacillus*. VSL#3, a proprietary blend of eight bacterial strains, is also effective.[1,20]

## DERMATITIS

Approximately 80% of patients treated with radiation therapy experience some form of skin irritation, ranging from hyperpigmentation to ulceration. These conditions may lead to pain, discomfort, itching, burning, or even permanent scarring. Calendula cream might be helpful.[1] Aloe vera gel and hyaluronic acid are not recommended due to lack of effect.[27]

## RESOURCE LINKS

- [Anxiety](https://www.va.gov/WHOLEHEALTHLIBRARY/overviews/anxiety.asp): <https://www.va.gov/WHOLEHEALTHLIBRARY/overviews/anxiety.asp>
- [Chronic Pain](https://www.va.gov/WHOLEHEALTHLIBRARY/professional-care/chronic-pain.asp): <https://www.va.gov/WHOLEHEALTHLIBRARY/professional-care/chronic-pain.asp>
- [Depression](https://www.va.gov/WHOLEHEALTHLIBRARY/professional-care/depression.asp): <https://www.va.gov/WHOLEHEALTHLIBRARY/professional-care/depression.asp>
- [Passport to Whole Health](https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf): [https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport\\_to\\_WholeHealth\\_FY2020\\_508.pdf](https://www.va.gov/WHOLEHEALTHLIBRARY/docs/Passport_to_WholeHealth_FY2020_508.pdf)
- [Recharge](https://www.va.gov/WHOLEHEALTHLIBRARY/self-care/recharge.asp): <https://www.va.gov/WHOLEHEALTHLIBRARY/self-care/recharge.asp>

## AUTHOR(S)

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*This Whole Health tool was made possible through a collaborative effort between the University of Wisconsin Integrative Health Program, VA Office of Patient Centered Care and Cultural Transformation, and Pacific Institute for Research and Evaluation.*

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