

The Journal of **Supportive**
ONCOLOGY

Quality of Life • Symptoms/Side Effects • Palliative Care

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How to Keep Your Patients Moving

Lisa Hoffman, MA

Clinical experience has shown that moderate physical activity is beneficial to patients with cancer. Structured physical activity can help a cancer patient to perform activities of daily living with less effort, cope with fatigue, increase aerobic capacity, counter the effects of inactivity, and help fight depression while feeling more in control of his or her own body.¹⁻⁴

Cancer-related fatigue is now recognized as the most common side effect of cancer, with 40%–90% of patients reporting fatigue as a side effect of treatment.³ Light exercise is one of the interventions suggested to prevent or decrease fatigue.³

Moderate physical activity, such as walking, cycling (continuous or intermittent), light weights, relaxation techniques, and stretching can help maintain physical function, combat fatigue, and decrease nausea and neuropathy. Perhaps most importantly, light exercise can give patients a feeling of being proactive during cancer treatment, a sense of regaining control and of being an active participant in their recovery. Furthermore, moderate activity actually tends to increase energy instead of depleting it. Exercise helps correct the effects of inactivity, such as muscle weakness, loss of energy, and stiffness.⁵ Finally, exercise helps reduce anxiety and depression. Table 1 summarizes the potential benefits of exercise for the patient with cancer.

What to Do?

There is not one ultimate exercise prescription for cancer patients at various stages of the disease. At this moment, unfortunately, there are no explicit standards for the type, frequency, duration, intensity, or progression of exer-

cise for people in cancer treatment. However, studies conclude that exercise is safe, feasible, and beneficial to patients' quality of life at almost any stage of cancer therapy.

Obviously, the level of physical activity will vary from patient to patient and by stage of disease. The overall aim is simply to get the patient up, moving, and functioning a little at a time.

The American College of Sports Medicine has set guidelines for the general population, and people in cancer treatment may follow the same suggestions to a greater or lesser degree. The guidelines call for exercising 3–5 five days a week, accumulating 20–30 minutes per session.⁵ This prescription will be appropriate for some patients with cancer, but not all. Some will be able to perform only light, short exercises.⁶ Obviously, many cancer patients will not feel like exercising at certain times during their chemotherapy cycles. These “down days” are different for each patient and may vary from cycle to cycle. The key point is to build flexibility into the exercise prescription so that patients with cancer can modify the frequency, intensity, and duration of exercise depending on their response to treatment.⁶

What Kind of Exercise?

The next question always concerns the type of exercise. For patients who are fully mobile and energetic, walking and cycling are the two activities recommended most often. Walking is a natural choice because it relates to all of the activities of daily living that anyone recovering from a disease looks forward to doing.^{1,7-12} Some studies^{9,13} used stationary cycling as an intervention for individuals after their bone marrow transplants; these studies were conducted primarily in a hospital setting. Stationary cycling can be initiated even while the patient is bed-ridden and able to move only his or her legs.⁹ Swimming has proven to be another good aerobic activity that promotes cardiovascular and overall fitness.

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Table 1**Potential Benefits of Exercise for Cancer Patients**

Maintains physical function
Combats fatigue
Maintains muscle strength
Decreases nausea and neuropathy in the short term
Enhances mood
Diminishes consequences of cancer treatment, such as early menopause because of chemotherapy or the increased risk of osteoporosis in the long term
Prevents pneumonia that can come with too much bed rest
Maintains digestion
Stimulates endorphins that give the patient a sense of well-being
Fights depression and the feeling that the patient has lost control over his or her life

Many patients with cancer will not be able to perform 30 minutes of continuous exercise. For such patients, intermit-

tent or interval exercise may be best—that is, short stints of exercise and rest until they accumulate the 30-minute recommendation.

From those who can barely get out of bed to others who are walking, jogging, and in the process of resuming a normal life, there are basic exercises that can help in everyone's recovery. As noted by Dr. Stephen Nimer, Head of the Division of Hematologic Oncology at Memorial Sloan-Kettering Cancer Center, "There is no reason not to start some kind of activity as soon as you can during and after cancer treatment."¹⁴

Following are some simple exercises (Figures 1–12) that you may want to recommend to your patients, as appropriate.¹⁴ Please feel free to photocopy any or all of the following pages to give to your patients. On the website for *The Journal of Supportive Oncology* (www.insertwebaddresshere.com), you may also find Table 2, a physical activity chart for patients with cancer that will serve as a reminder of what activities you may want to recommend to certain patients and act as a guide for patients on what activities might be most beneficial.

References

1. Courneya KS, Friedenreich CM. Physical exercise and quality of life following cancer diagnosis: a literature review. *Ann Behav Med* 1999;21:171–179.
2. Graydon JE, Bubela N, Irvine D, Vincent L. Fatigue-reducing strategies used by patients receiving treatment for cancer. *Cancer Nurs* 1995;18:23–28.
3. Schwartz AL. Patterns of exercise and fatigue in physically active cancer survivors. *Oncol Nurs Forum* 1998;25:485–491.
4. Segar ML, Katch VL, Roth RS, et al. The effects of aerobic exercise on self-esteem and depressive and anxiety symptoms among breast cancer survivors. *Oncol Nurs Forum* 1998;25:107–113.
5. American College of Sports Medicine. *ACSM's Guidelines for Exercise Testing and Prescription*. 6th edition. Philadelphia, Pa: Lea & Febiger; 2000.
6. Courneya KS, Mackey JR, Jones LW. Coping with cancer: can exercise help? *Phys Sportsmed* 2000;28:49–73.
7. Dimeo F, Rumberger BG, Keul J. Aerobic exercise as therapy for cancer fatigue. *Med Sci Sports Exerc* 1998;30:475–478.
8. Dimeo F, Tilmann M, Bertz H, et al. Aerobic exercise in the rehabilitation of cancer patients after high dose chemotherapy and autologous peripheral stem cell transplantation. *Cancer* 1997;79:1717–1722.
9. Dimeo F, Fetscher S, Lange W, Mertelsmann R, Keul J. Effects of aerobic exercise on the physical performance and incidence of treatment-related complications after high-dose chemotherapy. *Blood* 1997;90:3390–3394.
10. Godfrey CM. "Yes" to exercise for breast cancer survivors. *CMAJ* 1998;159:1358.
11. Mock V, Burke MB, Sheehan P. A nursing rehabilitation program for women with breast cancer receiving adjuvant chemotherapy. *Oncol Nurs Forum* 1994;21:899–907.
12. Dimeo F, Bertz H, Finke J, et al. An aerobic exercise program for patients with haematological malignancies after bone marrow transplantation. *Bone Marrow Transplant* 1996;18:1157–1160.
13. Peters C, Lötzerich H, Niemeier B, Schüle K, Uhlenbruck G. Influence of a moderate exercise training on natural killer cytotoxicity and personality traits in cancer patients. *Anticancer Res* 1994;14:1033–1036.
14. Hoffman L, Freeland A. *The Healing Power of Movement*. Cambridge, Mass.: Perseus Publishing; 2002.

Please feel free to photocopy the following four pages, courtesy of the author, Perseus Publishing, and The Journal of Supportive Oncology.

Bed Exercises: When you are feeling low

Goal: To prepare your body for movement. This section is for those who feel generally exhausted and defeated by even the smallest activity.

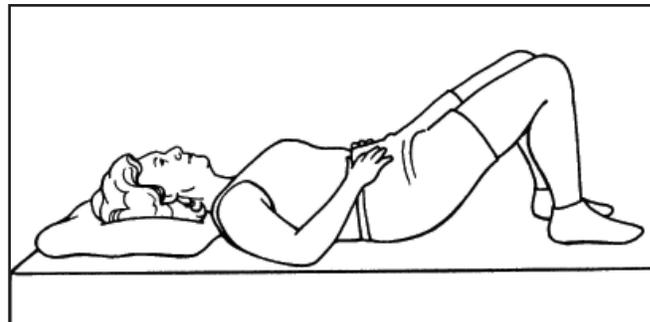
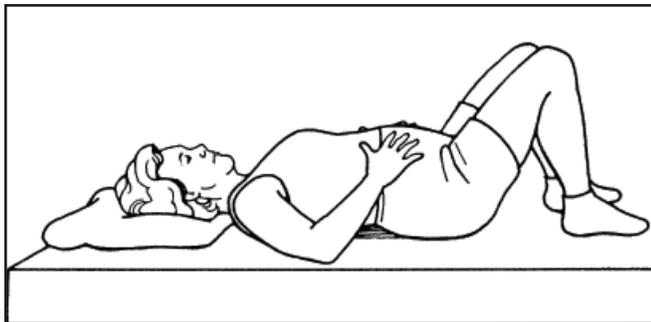


Figure 1 Deep Breathing/Pelvic Tilts

Starting position (left): Lie on your back with both knees bent, feet flat on the bed, and your hands on your abdomen. **Action (right):** Inhale and feel your abdominal area rise to the ceiling (feeling a big belly) and exhale while drawing your belly button to your spine, keeping your lower back on the bed. **Notes:** It is beneficial for anyone during cancer treatment, particularly for early postoperative breast surgery patients, to expand the chest cavity, relax and reduce muscle tension in your chest, and enhance lymphatic circulation by moving your diaphragm.

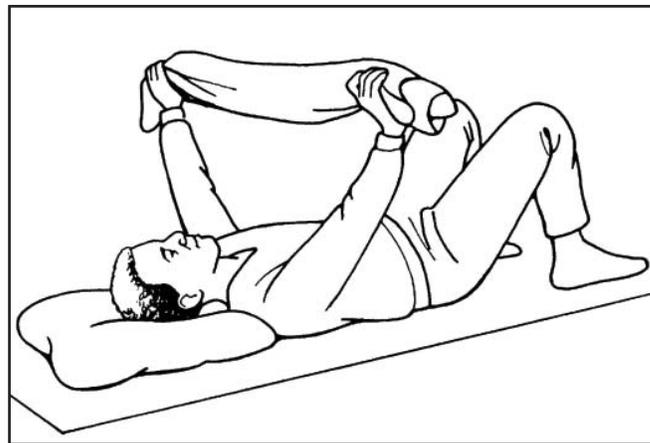
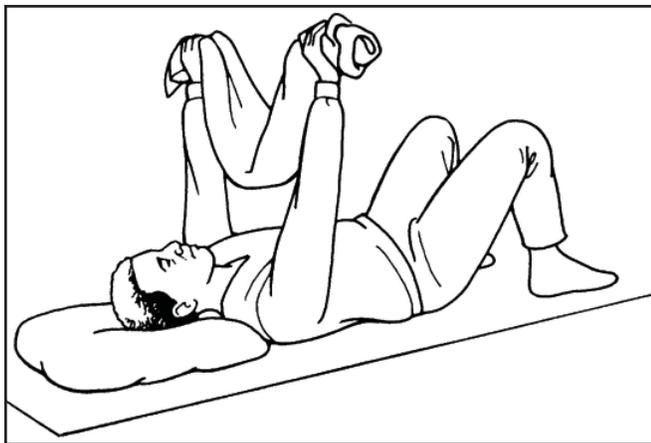


Figure 2 Towel Push-Outs

Starting position (left): Lie on your back with both knees bent and your feet flat on the bed. Hold onto a rolled towel by the ends with your hands up to the ceiling. **Action (right):** Exhale as you extend your arms out to the side, keeping your towel taut, and hold this position for five counts. Inhale and return your arms to the starting position. Repeat 5–10 times.

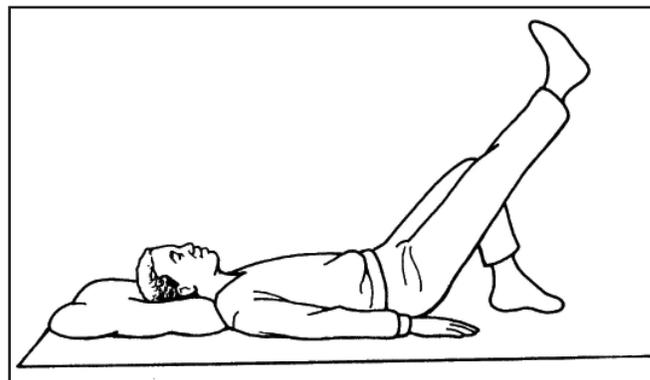
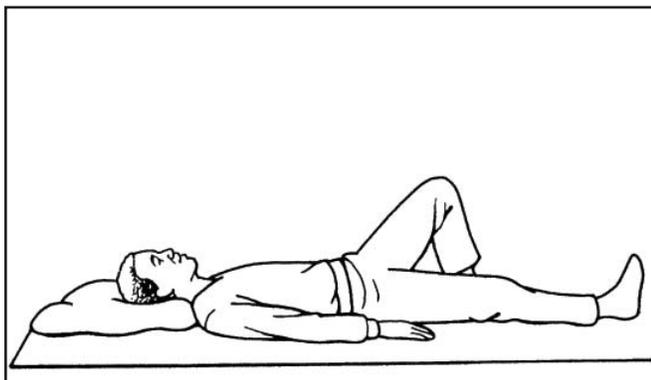


Figure 3 Leg Lifts

Starting position (left): Lie on your back with both knees bent, feet flat on the bed, with your arms at your sides. Slide one leg straight down and flex your foot. **Action (right):** Exhale and lift your straight leg off the bed to a 45-degree angle to the ceiling. Inhale and release down. Repeat 5–10 times with each leg. **Notes:** Pull in your abdominal muscles to support your back. You may limit the height of the lift for comfort. If there is pain in your hip joint because of orthopedic concerns, metastasis, or joint limitation, please modify or refrain from doing this exercise. This exercise can also be done starting with both knees bent and feet flat on the bed; then extend one leg at a time toward the ceiling.

Chair Exercises: Beginning to move

Goal: To prepare your body for standing, maintaining balance, and proper posture, and to restore and increase lower and upper body strength.

Figure 4 Mid-Back Pull Backs

Starting position (left): Sit on the edge of your chair or bed, keeping your spine long and your feet flat on the floor. Bring your palms to the back of your head with your elbows by your ears. **Action (right):** Exhale while bringing your shoulder blades together and your elbows out to the side and hold for 3 counts. Inhale and release. Repeat 10 times. **Notes:** Maintain an upright posture by tightening your abdominal muscles. If your shoulder joint or chest area has limited range of motion resulting from surgery or if you have a venous port, please modify this exercise for comfort.

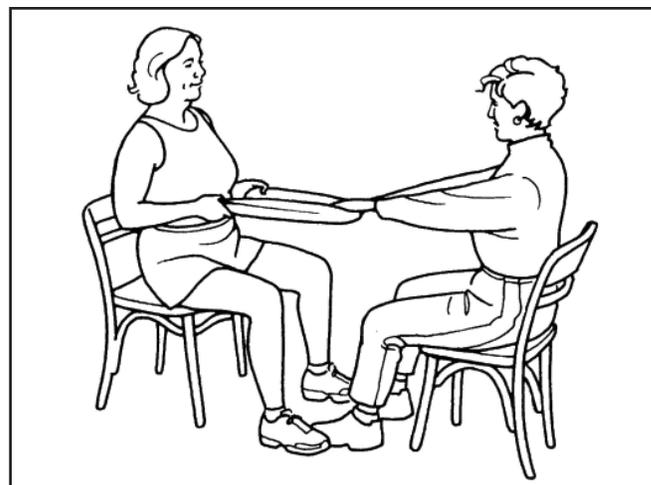
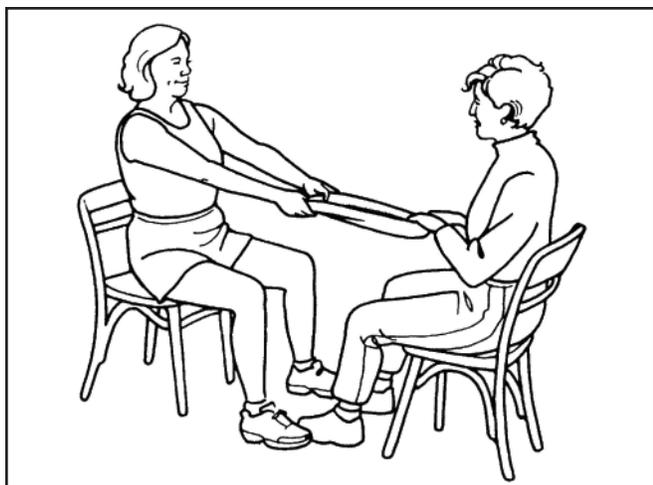
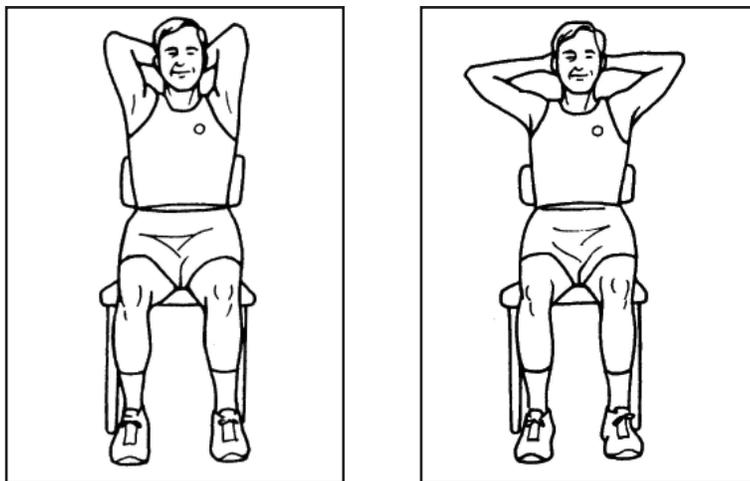


Figure 5 Partner Pull Backs

Starting position (left): Sit on the edge of your chair or bed, keeping your spine long and your feet flat on the floor. With your arms straight out in front of you, hold onto the ends of a towel. Your partner should sit on a chair in front of you, holding onto the middle of the towel. **Action (right):** Exhale as you bend your elbows and pull them back along your side, squeezing your shoulder blades together. Your partner should give you some resistance. Inhale and then give your partner some resistance to return to your starting position. Repeat 10 times.

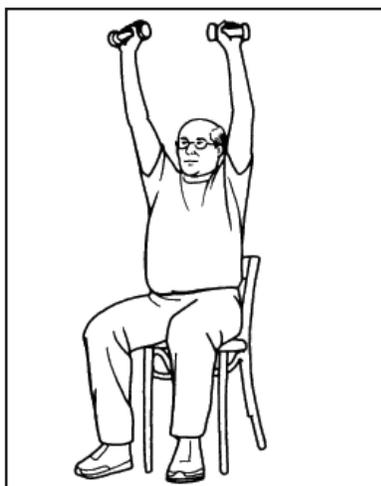


Figure 6 Overhead Lifts

Starting position (left): Sit on the edge of your chair or bed, keeping your spine long and your feet flat on the floor. Hold your weights with your palms facing forward, resting the weights on your shoulders. **Action (right):** Exhale and slowly extend your arms straight overhead. Inhale and bend your elbows as you lower the weights to your shoulders. **Notes:** Maintain an upright posture by tightening your abdominal muscles. Repeat 5–10 times. If your shoulder joint has limited range of motion because of surgery or a venous port, please modify for comfort by lifting one arm at a time or change the direction of your arms to face each other instead of straight ahead.

Standing Exercises: Walking, balance, building endurance

Goal: To get back into a routine. The following exercises are weight-bearing exercises to benefit your bones, muscles, and posture.

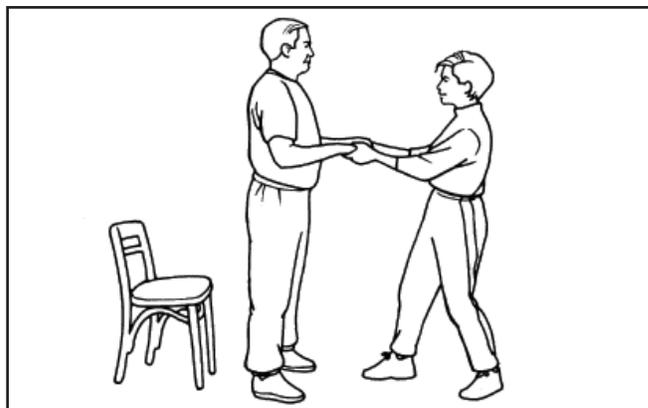
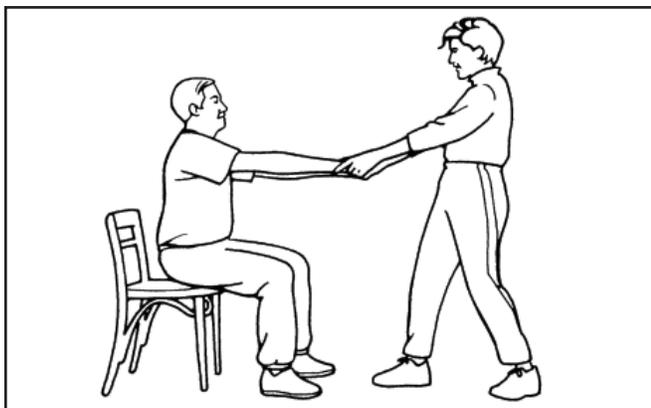


Figure 7 Stand and Sit

Starting position (left): Sit on the edge of your chair, keeping your spine long, feet flat on the floor, and hands holding onto your partner's hands. **Action (right):** Exhale and rise to a standing position while holding your partner's hands only for support. Use your legs for power. Inhale and gently sit back down. Repeat 5–10 times. **Notes:** Keep your knees and feet hip-width apart at all times. Lean forward with weight over your toes as you stand and sit. As you become more comfortable with this exercise, you can try it on your own, with your hands on the chair for leverage or with your arms straight out in front of you.

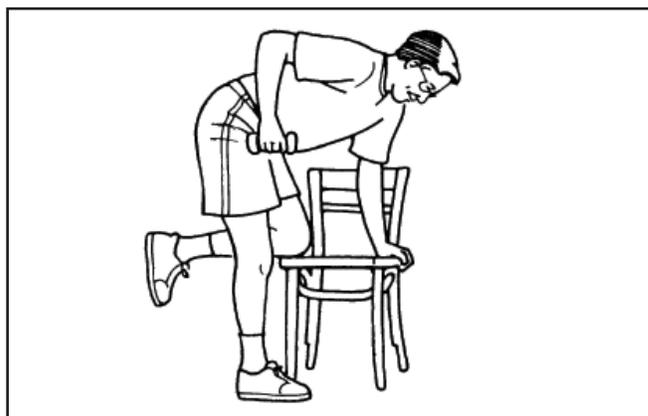


Figure 8 One-Arm Rows

Starting position (left): Stand beside a chair. Rest one knee and one hand on the chair. Your back should be parallel to the floor with your head down. Hold a weight or water bottle in your other hand, extending your arm down. **Action (right):** Exhale and bend your elbow, bringing your arm up so your elbow is above your back. Inhale as you bring your arm down. Pull up and down slowly 10 times, then repeat on other side. **Notes:** Use a weight that is comfortable for you to lift 10 times. You can use a small water bottle or hand-held weight that does not exceed 10 pounds—increase the weight slowly and wisely. Use your back muscles for the lift. Lifting heavy weight is not recommended for those at risk of lymphedema.

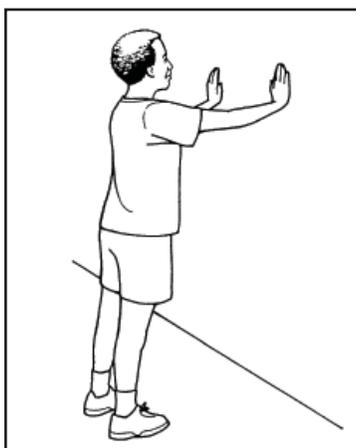


Figure 9 Standing Wall Push-Ups

Starting position (left): Standing, place both hands on the wall, with arms straight and fingertips facing up. **Action (right):** Inhale and bend your elbows as you lean into the wall. Exhale and push out, so your arms straighten. Repeat 10 times. **Notes:** For added stretch and range of motion at shoulder joint, simply face the wall and crawl your fingers up the wall as far as you can, then crawl down. This exercise can also be done facing the wall sideways and crawling up the wall with one palm facing up. This exercise may be familiar to those recovering from breast surgery.

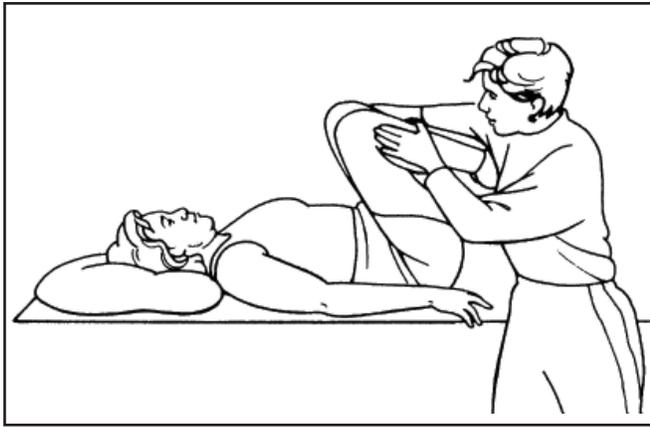


Figure 10 Lower Back Stretch

Lie on your back with both knees bent and your feet flat on the floor or bed. One at a time, bring your knees into your chest. Your partner can lightly press your knees into your chest. Hold for 20 seconds and then release. If you have knee concerns, your partner can hold onto you under your knees. You should feel a stretch in your lower back. Communicate; let your partner know if he or she is pressing or not pressing enough. Lacking a partner, you can hold your knees to your chest on your own.

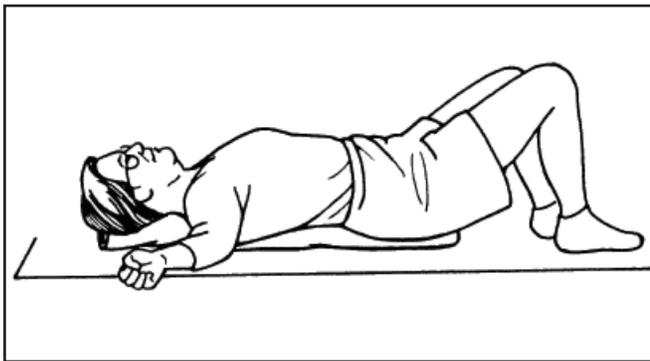


Figure 11 Back Release and Chest Stretch

Lie on a rolled towel placed lengthwise under your spine with your head resting on the towel. Open your arms out to the side with the palms up. Your knees can be bent with both feet flat on the floor or both legs can be extended straight down, depending on what is most comfortable. Breathe deeply in this position. Hold for 20–30 seconds. This exercise is recommended to relieve tension and tightness in the chest, upper back, and shoulder areas.

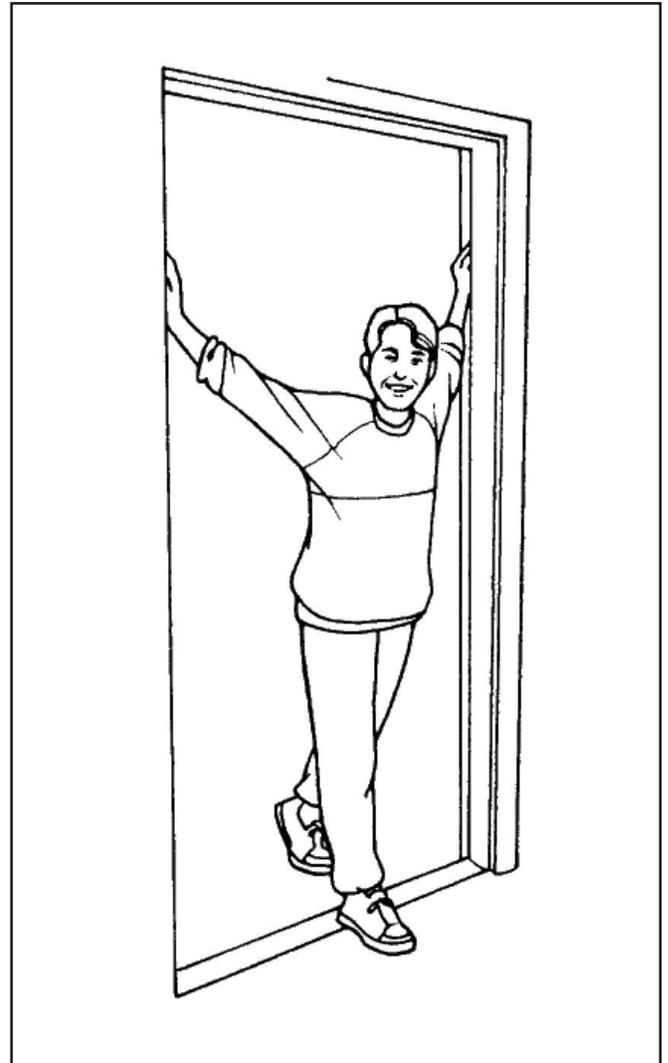


Figure 12 Standing Chest Stretch

Stand in a doorway and hold onto the sides with your elbows bent at 90-degree angles. Step forward with one leg, as if you're walking into the room, so that your elbows are slightly behind you and your chest is open. Hold for 20 seconds. **Notes:** If you have a port in your chest area, this stretch is not recommended if it is uncomfortable. If you feel tightness in your chest due to surgery, stretch the chest area gently after getting your physician's approval. This exercise can also be done in a corner of the room, bending your elbows at 90-degree angles and leaning into the corner.

The exercises illustrated in this article originally appeared in *The Healing Power of Movement* by Lisa Hoffman, MA, with Alison Freeland. © Lisa Hoffman, MA, and Alison Freeland. Illustrations by Meryl Henderson. Reprinted with permission of Perseus Books PLC, a member of Perseus Books, LLC. The book also contains other exercises appropriate for cancer patients at various stages of disease/treatment.

Table 2

Cancer Treatment Strategies and Physical Activity Recommendations

SURGERY			
System	Concerns		Physical activity recommendation
Joint/muscle limitation	Incision areas, muscles cut during surgery, part or all of muscle may be removed. In reconstruction, may have tightness and soreness in area.		<ul style="list-style-type: none"> • Prior to surgery, maintain muscle strength to aid recovery. Will be asked to get out of bed shortly after surgery. • Prior to surgery, stretch the area that will be affected to help in flexibility. • Begin limited (bed exercises) program 1–2 weeks post surgery, as per physician.
Lymphatic system/impairment of lymphatic system	If lymph nodes are removed, there may be some short- and long-term concerns regarding lymphedema and infection.		<ul style="list-style-type: none"> • Slow, progressive exercise, increasing ROM, facilitate draining with pumping action, compression (area where lymph nodes were taken), to begin program as per physician. • May incorporate diaphragmatic breathing, passive exercise, isometrics (contract/release) within a few days post surgery.
Neurologic	Neuropathy; numbness, loss of sensation around incision or nerve damage from incision		<ul style="list-style-type: none"> • Moderate movement in limbs to facilitate mobility. • Breathing techniques and relaxation may help in sensory awareness. • Focus on various balancing exercises for stability.
CHEMOTHERAPY (SYSTEMIC)			
System	Side effects	Symptoms	Physical activity recommendation
Cardiovascular	Cardiomyopathy Pulmonary restrictions	Heart palpitations Arrhythmia Shortness of breath Leg swelling Exhaustion Shift in blood pressure Dizziness	<ul style="list-style-type: none"> • Your aerobic capacity may be compromised; therefore, intermittent (stop and start) exercise is recommended. • Type of activity can vary—walking/cycling/swimming. • Begin the exercise program in a slow, progressive manner. • When changing body positions for exercises from a sitting or lying position to a standing position, move slowly to decrease dizziness and dramatic shifts in blood pressure. • With prolonged bed rest, blood pressure, pulmonary function, and bone density may be compromised; therefore, it is recommended to get out of bed and move around.
	Decrease in RBCs	Anemia Fatigue	<ul style="list-style-type: none"> • Your aerobic capacity may be compromised; therefore, intermittent (stop and start) exercise is recommended. • Heart rate during activity should be low to moderate (40%–60% of maximum heart rate [max rate = 220 – age]). • Begin exercise when appropriate in a slow, progressive manner. • Maintain proper breathing patterns with given exercise.
	Decrease in WBCs	Susceptibility to infection	<ul style="list-style-type: none"> • It is recommended to partake in non-contact sports or activities to decrease risk of injury. • Before and after using equipment, wash your hands. • Begin exercise when appropriate in a slow, progressive manner.
	Low platelet count	Risk of bleeding Bruising	<ul style="list-style-type: none"> • Avoid contact sports and other activities that might result in cuts or bruising.
Neurologic	Peripheral neuropathy	A tingling, burning, weakness, or numbness in the hands and/or feet. Other nerve-related symptoms include loss of balance, clumsiness, difficulty picking up objects and buttoning clothing, walking problems, jaw pain, hearing loss, stomach pain, constipation.	<ul style="list-style-type: none"> • Maintain movement at the extremities (fingers, toes). Wiggle your fingers and toes a few times a day. • If your sense of balance is affected, you can avoid falls by moving carefully, using handrails when going up and down stairs, and using bath mats in the bathtub or shower. • Practice balancing exercises and focus on leg exercises along with maintaining core (torso) stability.
Gastrointestinal	Nausea, vomiting Mucositis Loss of appetite Constipation Diarrhea	May limit ability to eat well and absorb needed nutrients.	<ul style="list-style-type: none"> • With decreased energy, it may be difficult to sustain activity. Instead, intermittent activity is recommended. • Activity for a prolonged period of time may be uncomfortable if diarrhea is a concern. • Full-body activity may aid in digestion and removal of waste if constipation is a concern.

Table 2 (continued)

Cancer Treatment Strategies and Physical Activity Recommendations

Other	Hair loss Nail thinning/loss Skin irritation	Redness, itching, peeling dryness, and acne. Nails may become darkened, brittle, or cracked. They also may develop vertical lines or bands. Some people report feeling as though they have the flu a few hours to a few days after chemotherapy. Flulike symptoms (muscle aches, headache, tiredness, nausea, slight fever, chills, and poor appetite) may last from 1–3 days.	<ul style="list-style-type: none"> • In cool weather, use head covering to maintain body temperature. • Use sunscreen when outside for walking or cycling. • Use caution when handling weights or exercise equipment if nail thinning or breaking is a concern. • Skin irritation should not affect walking, cycling, or swimming abilities; however, chlorinated pools may irritate the skin. • With flulike symptoms, work within your capabilities at this time.
Gynecologic	Anticancer drugs may damage the ovaries and reduce the amount of hormones they produce. As a result, some women find that their menstrual periods become irregular or stop completely while they are receiving chemotherapy.	The hormonal effects of chemotherapy also may cause menopausal-like symptoms such as hot flashes and itching, burning, or dryness of vaginal tissues.	<ul style="list-style-type: none"> • Maintain physical activity to maintain muscle mass and enhance cardiorespiratory conditioning. • Perform weight-bearing activity to promote bone health (any activity with your feet on the ground, such as walking, stair climbing, dancing). • Focus on torso strengthening and back, chest, and abdominal muscles. Promote good posture. • Relaxation techniques may help in coping with hot flashes and other menopausal-like symptoms.
RADIATION			
System	Side effects	Symptoms	Physical activity recommendation
Localized	Head and neck: hypothyroidism, esophagus, mucositis. Chest: cardiac toxicity. Pelvic area: vaginal complications, bladder and gastrointestinal issues, hematuria.	The body uses energy to heal itself. Any symptoms are mostly felt after a few weeks of radiation therapy. In some cases, onset of side effects may not happen until a few years later.	<ul style="list-style-type: none"> • Your aerobic capacity may be compromised; therefore, intermittent (stop and start) exercise is recommended. • Heart rate during activity should be low to moderate (40%–60% of maximum heart rate [max rate = 220 – age]). • Begin exercise when appropriate in a slow, progressive manner. You may want to stay away from any impact or jarring activity for bladder concerns. • Maintain proper breathing patterns with any given exercise. • Depending on the site radiated, site-specific exercise may feel difficult. ROM at the area may feel limited. Therefore, gently move the area to increase mobility.
Skin	Short-term changes in skin appearance; long-term changes (6–10 months); thickening of the skin.	Itchy, dry, flushed, warm, uncomfortable	<ul style="list-style-type: none"> • Moisturize dry skin area (as approved by physician), and when handling exercise equipment to protect skin from cracking. • Area of skin that is radiated may become tight and limit the range of motion. Work progressively to maintain mobility. • Perform exercise program in a well-ventilated room to help prevent overheating. Drinking plenty of water is recommended. • Wear loose-fitting clothes to decrease skin irritation.
Lymphatic	May initiate onset of lymphedema by scar formation or skin burn.	Lymphedema	<ul style="list-style-type: none"> • Enhance lymphatic circulation with diaphragmatic breathing. • Isometric, hand squeezing, or pumping exercises. • Use light weights for upper body strengthening in a progressive manner.
TRANSPLANT (SYSTEMIC)			
System	Side effects	Physical activity recommendation	
Bone marrow/stem cell transplant	Affects WBCs/RBCs/platelets	<ul style="list-style-type: none"> • Start program 3–4 weeks post transplant, with the bed, chair, and standing program or as recommended by your physician. • May perform intermittent walking or stationary cycling. • Modify movement if sore from biopsy area. 	

Abbreviations: ROM = range of motion; RBCs = red blood cells; WBCs = white blood cells.