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# Lung Cancer and Exercise?

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Regular exercise is one of the best things a person can do as a cancer patient or survivor, with studies showing improvements in cardiorespiratory fitness, quality of life, fatigue, and depression. However, very few studies have focused on the feasibility, safety, or efficacy of exercise in lung cancer patients. Is exercise safe for people with lung cancer? Is it beneficial? Is a long-term exercise program feasible? Yes. Yes. And yes, say experts.

## The Results Are In

Over the past few years, researchers have produced small, but significant data showing exercise may also have important benefits for lung cancer patients and survivors, regardless of disease stage or limited physical activity, also called "de-conditioning," which can cause the heart and muscles to regress and become less efficient.

According to Lee Jones, PhD, scientific director of the Duke Center for Cancer Survivorship at Duke University School of Medicine, fitness levels in lung cancer patients are 30 to 40 percent below average healthy adults, in many cases related to long-term effects of smoking. However, exercise therapy can increase these fitness levels, whether it is performed before or after surgery.

Cardiorespiratory fitness—the capacity of the heart, lungs, and circulatory system to transport oxygen to the working skeletal muscles—is dependent on age and gender and varies based on the amount of exercise an individual performs on a regular basis.

In addition to improving cardiorespiratory fitness in lung cancer patients, research shows that exercise training is also associated with several positive patient-reported outcomes including improvements in fatigue, depression, sleep, quality of life, and breathlessness. And these benefits may extend across the board, Jones says, regardless of disease stage, treatment, or whether patients have received surgery or not.

“Fitness, believe it or not, is among one of the strongest predictors of how long you will live,” Jones says. “Your fitness level before surgery will predict your risk of surgical complications as well as following surgery. Now we have data suggesting that your fitness levels pre-surgery may also predict how long lung patients may live beyond traditional markers of longevity.”

As the lead investigator of a study published in the journal *Cancer* in 2007, Jones showed that four to six weeks of aerobic exercise, consisting of stationary cycling

five times a week, before surgery improved fitness levels by 15 to 22 percent. However, the study only included 20 patients with lung cancer, most of whom had non-small cell lung cancer.

He led another study, published in *Cancer* in 2008, which included 19 NSCLC patients, showing that 14 weeks of exercise therapy (consisting of stationary cycling three times a week) after lung cancer surgery improved fitness levels by approximately 11 percent (a healthy person is expected to improve by 15 percent). While fitness levels of patients who exercised during chemotherapy did not improve, Jones says exercise may still be beneficial.

“We don’t know what happens to [patients’] fitness just getting chemotherapy without exercise training,” he says. “You probably assume that fitness would go down. So, even maintaining fitness across the course of chemotherapy might still be an important benefit for lung cancer patients.”

Although both studies were small—19 patients in the pre-surgery study and 19 in the post-surgery study completed the assessment—adherence rates were around 72 percent for the first study and 85 percent for the second study.

Another study of 25 NSCLC patients, published in May 2009 in the *Journal of Thoracic Oncology* showed that twice-weekly aerobic and weight training sessions over an eight-week period improved lung cancer symptoms and muscle strength in advanced NSCLC patients. However, only 11 participants completed all 16 sessions, with medical complications and “deterioration in health status” as the most common reason for withdrawal. Clearly, larger-scale, controlled, randomized studies will be needed to confirm and quantify these benefits, as well as to provide insights regarding what would be optimal exercise regimens.

## A Good Start

Gary Kimmel, MD, a retired oncologist and founder of the non-profit Cancer Foundation for Life ([www.CancerFoundationForLife.org](http://www.CancerFoundationForLife.org)) based in Tyler, Texas, provides free individualized exercise rehabilitation programs for cancer survivors through the foundation’s “FitSTEPS for Life” program. The program has expanded to include an additional 16 locations in Dallas and East Texas.

“We really like to get lung patients into our program because I don’t care what state they’re in, they can usually be significantly improved,” Kimmel says.

Although it is still unclear which specific exercises have the greatest benefits for lung cancer patients, both Jones and Kimmel strongly recommend lung cancer survivors incorporate some form of physical activity into their day. Jones suggests parking further away at the grocery store, walking to the bus stop or around the block, and walking to work rather than taking a car.

☒ "If they will start off with minimal amounts of exercise and plan on it being long-term, they will amaze themselves with what they can achieve." ☒

—Gary Kimmel, MD

Aerobic (endurance) training is a great way to improve fitness, Jones says, because it not only improves your cardiac function (the amount of blood pumped around the body per heartbeat), but also improves your oxygen-carrying capacity. Examples of aerobic training include walking, swimming, or any activity that requires the heart and lungs to work harder than at rest.

While resistance training doesn't really improve fitness levels in healthy adults, Jones says that lung cancer patients may benefit from resistance training because it can strengthen muscles that were weakened due to disease or treatments. The most beneficial, Jones says, are compound exercises—exercises that use several large muscle groups—such as leg squats, chair exercises (sit in a chair then stand up), shoulder presses (hold small dumb-bell weights shoulder-height, lift straight up then back down to shoulders), and wall push-ups (stand facing a wall and perform a push-up against it).

### Developing an Exercise Program

Jones suggests starting off with short periods of moderate activity several times a day, such as a 10 to 15 minute walk three times a day. The goal for everybody, Jones says, is to exercise for at least 30 minutes at least five days a week. But this doesn't mean a person must exercise for 30 consecutive minutes all at once to reap the benefits—three 10-minute exercise sessions still adds up to the recommended 30 minutes of exercise in one day.

“You can really reduce the duration of those [exercise] sessions,” Jones says. “But if you can repeat those sessions as often as you can throughout the day, then you'll really start to accumulate some of the benefits.”

The key is to find what you're able to do physically and build on it. For a person who can't walk 50 feet before getting short of breath, Kimmel suggests walking 25 feet, taking a short rest, walking another 25 feet, and then rest again. “Maybe do four or five sessions of that three or four times a day,” he says. “You want people to feel empowered by what they are doing because they will get surprised after a couple of weeks of this.”

Kimmel says walking with a pedometer and counting steps can be particularly motivating for lung cancer survivors because, “as they continue to walk over time, they'll find that they're able to walk longer distances for longer periods of time.”

Kimmel encourages survivors to set short- and long-term fitness goals and to embrace exercise rehabilitation as a journey, not a destination. “It's a fun journey,” Kimmel says, “because you continue to see more and more improvement, and you're experiencing better and better quality of life, and you're able to do more and more things.”

Even for patients with significantly compromised physical functioning that has compromised their quality of life, Kimmel says that “if they will start off with minimal amounts of exercise and plan on it being long-term, they will amaze

themselves with what they can achieve.”

## Finding Help

Although it isn't standard care for lung cancer patients, Jones suggests looking into local pulmonary rehabilitation programs. “These programs will give structure and will let patients know the right ways to exercise and how to monitor the intensity of physical activities,” he says.

> American Association of Cardiovascular and Pulmonary Rehabilitation ([www.aacvpr.org](http://www.aacvpr.org)) provides a searchable directory of rehabilitation programs across the U.S. under “Resources.”

> The American Association for Respiratory Care's patient education website ([www.YourLungHealth.org](http://www.YourLungHealth.org)) has a directory of pulmonary rehabilitation facilities searchable by state.

> The American Lung Association's ([www.LungUSA.org](http://www.LungUSA.org)) “In My Community” section allows you to search for local programs by entering your zip code or using the clickable map of the U.S.