

# Postoperative Nutritional Strategies for Lung Cancer Patients: Enhancing Recovery and Well-Being

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## Abstract

Lung cancer is a common and serious malignancy, and dietary management plays a pivotal role in the postoperative recovery process for lung cancer patients. This study explores the nutritional requirements, dietary challenges, and dietary strategies for postoperative lung cancer patients. The research indicates that lung cancer patients require additional nutritional support after surgery to expedite wound healing, reduce the risk of postoperative complications, and enhance their quality of life. Key nutrients such as protein, vitamin C, and zinc play critical roles in this process. However, postoperative lung cancer patients face challenges related to appetite loss, digestive issues, alterations in taste and smell perception, and emotional aspects affecting nutrition. Therefore, developing personalized dietary plans, including choosing easily chewable foods, adopting small and frequent meals, avoiding irritating foods, and considering nutritional supplementation while controlling dietary fiber, is crucial for supporting postoperative recovery for lung cancer patients. Postoperative recovery for lung cancer is a collaborative effort, and close cooperation between patients, healthcare professionals, and dietitians can facilitate faster and smoother recovery, ultimately improving the quality of life. Dietary management is not only about physical recovery but also about enhancing the overall quality of life, making it a significant aspect worthy of attention and support.

**Keywords:** Postoperative lung cancer; Dietary management; Nutritional requirements; Recovery; Dietary strategies.

## Introduction

Lung cancer is a malignant tumor that originates in the tissues of the lungs, typically characterized by uncontrolled growth and spread of cancer cells within lung tissues [1,2]. Lung cancer is broadly categorized into two main types: Small Cell Lung Cancer (SCLC) and Non-Small Cell Lung Cancer (NSCLC) [3]. NSCLC is the most common type, accounting for approximately 85% of all

lung cancer cases. SCLC, on the other hand, is another major type of lung cancer often associated with smoking [4]. The incidence of lung cancer exhibits significant geographical variations worldwide, with lower rates in Asian countries and higher rates in certain regions of North America and Europe [5]. Globally, approximately 181,000 people are diagnosed with lung cancer every year, and approximately 1.592 million people die from this disease ev-

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ery year. This not only brings a huge burden to individuals and families, but also poses a challenge to global public health [5,6]. Therefore, preventive measures and improved treatments are important steps to reduce the impact of lung cancer worldwide.

Dietary management, as an important aspect of health care, aims to maintain the health and functioning of the body by making informed choices about food [7]. Proper dietary habits not only help prevent various chronic diseases but also play a pivotal role in disease management and recovery. Core principles of dietary management include ensuring adequate intake of nutrients, maintaining an appropriate energy balance, and avoiding or limiting foods and beverages that are detrimental to health [8]. For patients with lung cancer, dietary management involves not only meeting basic nutritional requirements but also considering the potential adverse effects of lung cancer and its treatment on the patient's body [9]. Lung cancer patients often face challenges such as appetite loss, digestive issues, weight loss, and treatment-related side effects like nausea and changes in taste [10].

The treatment of lung cancer typically involves surgical removal of the tumor, radiation therapy, chemotherapy, or combinations of these approaches [11]. Regardless of the treatment modality, post-operative recovery is a crucial phase for patients to regain their health. During this process, dietary management plays a paramount role [12]. Dietary control can help post-lung cancer surgery patients maintain adequate nutritional intake to support body recovery and wound healing [13]. The surgical process may

lead to decreased appetite, and a well-planned diet can provide sufficient protein, vitamins, and minerals to facilitate tissue repair and recovery. Dietary management also aids in managing post-operative side effects [14]. Many lung cancer treatment methods are accompanied by discomfort such as nausea, vomiting, and dry mouth, which can affect patients' appetite and dietary choices [15]. In such cases, specific dietary strategies can help patients alleviate discomfort, ensuring they can continue to intake adequate nutrients. Weight loss is relatively common among lung cancer patients, especially during treatment. Proper nutritional intake can help prevent unnecessary weight loss while providing enough energy to support recovery and resistance to infection.

Lung cancer is a serious type of cancer that has a profound impact on patients' physical health and quality of life [16]. Dietary management plays a critical role in post-lung cancer surgery recovery, as it helps maintain nutritional balance, manage side effects, and improve the quality of life for patients. In the following article, we will delve more deeply into various aspects of dietary control after lung cancer surgery to better understand its significance in lung cancer recovery [17].

### Nutritional requirements after lung cancer surgery

After lung cancer surgery, patients require additional nutritional support to facilitate recovery, reduce the risk of complications, and improve their quality of life [18]. Nutrition plays a crucial role in this process by helping to maintain bodily functions and promote tissue healing (Table 1).

**Table 1:** Importance of nutrients in lung cancer patient recovery.

Nutrient	Function	Importance	Relevance to lung cancer patient recovery
Protein	Building and maintaining muscle tissue, promoting recovery	Reduces muscle loss, accelerates wound healing	Lung cancer surgery may lead to muscle loss; adequate protein intake helps maintain muscle mass and promote healing.
Carbohydrates	Providing energy, supporting body repair and recovery	Reduces weakness, maintains stable blood sugar	Carbohydrates provide energy to cope with post-surgery body repair, helping reduce weakness and supporting the immune system.
Fat	Aiding in the absorption of fat-soluble vitamins, providing extra calories	Maintains weight, supports the immune system and tissue repair	Adequate healthy fat intake helps maintain weight and supports the immune system, but a high-fat diet should be avoided.
Vitamins	Enhancing immune system function, maintaining normal physiological function	Reduces infection risk, promotes bone health	Vitamins enhance immune function, reduce infection risk, and maintain bone health.
Minerals	Maintaining bone health, supporting normal nervous system function	Facilitates tissue healing, preserves nerve function	Minerals are crucial for bone health and nerve function, which is highly important for lung cancer patient recovery.

Proteins are a vital component of the post-lung cancer surgery diet. They serve various functions and play a key role in the body's recovery and rehabilitation [17]. Patients may experience loss of muscle mass after surgery, referred to as muscle wasting. Proteins are essential components for building and maintaining muscle tissues; therefore, adequate protein intake is crucial in reducing muscle wasting [19]. Losing too much muscle can lead to physical weakness and impaired function, which can impact the speed and quality of recovery. Lung cancer surgery is often accompanied by incisions and tissue damage, making wound healing a critical aspect of post-operative recovery. Proteins are necessary for wound healing, as they contribute to the formation of new tissues and the repair of damaged cells. Sufficient protein intake can shorten the time needed for wound healing, reduce the risk of infection,

and improve the chances of a successful surgery [20].

Carbohydrates also play a crucial role in the post-lung cancer surgery diet. Patients require a substantial amount of energy after surgery to support the body's repair and recovery processes [13]. Carbohydrates serve as the primary source of energy, breaking down into glucose within the body for cellular use. Ensuring an adequate intake of carbohydrates helps patients feel energized, alleviates weakness, and promotes recovery. After lung cancer surgery, patients may be at risk of blood sugar fluctuations, particularly when undergoing chemotherapy. Opting for complex carbohydrates like whole grains, vegetables, and fruits can help maintain stable blood sugar levels, preventing issues associated with blood sugar fluctuations such as fatigue and dizziness.

Fat is another essential nutrient that aids in the absorption of fat-soluble vitamins such as vitamin A, vitamin D, vitamin E, and vitamin K. These vitamins are crucial for the immune system, bone health, and tissue repair. Therefore, an adequate intake of fat contributes to maintaining the balance of these vitamins [21]. Additionally, during lung cancer treatment, patients may be at risk of weight loss, and maintaining proper weight is crucial for recovery. Fat is a nutrient with high energy density, providing extra calories that help prevent unnecessary weight loss.

Vitamins and minerals are also essential components of the post-lung cancer surgery diet as they support the immune system in helping the body resist infections and diseases [22]. Nutrients such as vitamin C, vitamin D, zinc, and selenium enhance the functioning of the immune system, reducing the risk of infections.

Additionally, vitamins and minerals play a crucial role in normal functions such as wound healing, bone health, and nerve function. For example, calcium and vitamin D are vital for bone health, and the B-vitamins contribute to the normal functioning of the nervous system.

### Dietary challenges after surgery

Patients often face various dietary challenges following lung cancer surgery, which can have a negative impact on their nutritional intake and recovery [23]. Understanding and addressing these challenges are crucial to ensuring that patients receive adequate nutrition. In this study, we will explore the primary challenges faced in post-lung cancer surgery diets [24], including decreased appetite, digestive issues, changes in taste and smell, and the relationship between emotions and nutrition (Table 2).

**Table 2:** Impact mechanisms and hazards of dietary challenges in postoperative lung cancer patients.

Dietary Challenge	Causes	Impact mechanisms	Hazards
Appetite loss	Surgery chemotherapy radiation pain	Reduced activation of appetite centers nausea and vomiting make eating difficult Pain leads to eating discomfort	Nutritional deficiency weight loss prolonged postoperative recovery
Digestive issues	Surgical stimulation medication side effects altered gut microbiota	Decreased gastrointestinal motility medications induce gastrointestinal discomfort Imbalanced gut microbiota	Impaired nutrient absorption gastric discomfort and abdominal pain nutritional deficiencies and diarrhea or constipation
Taste and smell changes	Surgical impact chemotherapy medication	Impaired neural transmission altered taste perception nerves changes in odor perception	Limited dietary choices nutritional imbalance decreased dietary satisfaction
Emotions and nutrition	Emotional stress: Anxiety, depression	Emotional impact on appetite control center Increased emotional eating	Unhealthy eating habits nutritional deficiency weight issues and hindered recovery

Decreased appetite is one of the common issues after lung cancer surgery. Patients may experience a loss of appetite due to surgery, chemotherapy, radiation therapy, or other treatment methods. This can lead to reduced food intake, affecting their nutritional intake [25]. Chemotherapy and radiation therapy may cause discomforting symptoms like nausea, vomiting, and dry mouth, which can decrease a patient's appetite. Additionally, post-surgery pain may make eating difficult, causing patients to avoid food to alleviate discomfort.

After surgery, patients may experience gastrointestinal disturbances, leading to symptoms such as stomach discomfort, bloating, and abdominal pain. The surgical process itself can cause irritation or damage to the intestines, resulting in these discomforting sensations [26]. Some medications used in lung cancer treatment, especially chemotherapy drugs, can trigger diarrhea [27]. Furthermore, the patient's gut microbiome may be disrupted, leading to gastrointestinal discomfort and diarrhea. Additionally, during the recovery period, patients may face constipation issues due to reduced appetite, lack of physical activity, or medication side effects. Moreover, surgery and anesthesia medications may slow down intestinal motility, causing constipation.

Following lung cancer surgery, patients may undergo changes in taste and smell, which can significantly impact their dietary choices and taste perceptions [28]. Patients may find that the taste of certain foods becomes different or less palatable. Foods may become more bitter, sweeter, or saltier, which can make them averse to certain foods. Post-surgery changes in taste can also make them more sensitive to the smells and textures of cer-

tain foods [29]. Conversely, their perception of other foods may weaken. Changes in smell can make patients uncomfortable with the odors of certain foods, which can affect their appetite and food choices.

There is a close relationship between emotional states and nutrition, especially for lung cancer patients. The diagnosis and treatment of lung cancer can lead to feelings of anxiety and depression in patients. These emotional issues can affect the appetite and dietary choices of patients, resulting in an unbalanced diet. Some patients may tend to overeat or consume unhealthy foods under emotional stress, which can lead to weight issues and malnutrition. Providing psychological support and mental health therapy is crucial in addressing emotional problems [30]. Additionally, healthcare professionals can offer personalized dietary advice to help patients manage the relationship between emotions and nutrition.

### Dietary strategies for lung cancer patients after surgery

After lung cancer surgery, patients face a range of dietary challenges, including loss of appetite, digestive issues, changes in taste and smell, and their relationship with emotions [31]. To help patients overcome these challenges, dietary strategies become crucial. In this article, we will discuss four key dietary strategies, including soft and easy-to-chew foods, small and frequent meals, avoiding spicy foods, supplementing with nutritional products, and controlling dietary fiber, to help lung cancer patients achieve better nutrition and recovery (Figure 1).

**Alcohol:** Alcohol can stimulate the stomach lining, so drinking alcohol should be done cautiously or avoided.

After lung cancer surgery, patients may need to consider the use of nutritional supplements to ensure they receive adequate nutrition. Nutritional supplements can include protein shakes, balanced nutritional drinks, or vitamin and mineral supplements. These products can help patients meet their specific nutritional needs, especially in cases of reduced appetite or digestive issues. It is important to note that over reliance on supplements is not a long-term solution. Nutrients found in food are generally easier to absorb and utilize than supplements. Therefore, whole foods remain the best source of nutrition. On the other hand, for some lung cancer patients, the intake of dietary fiber may need to be limited. High-fiber foods, especially for those facing digestive problems, may exacerbate diarrhea or bloating [34]. Therefore, when designing a dietary plan, healthcare professionals may recommend limiting the intake of high-fiber foods until the patient's gastrointestinal system gradually adapts.

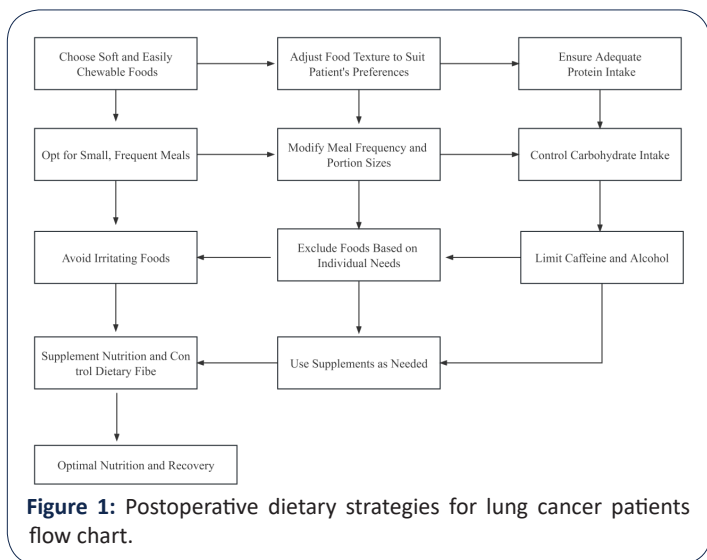
Dietary strategies after lung cancer surgery are crucial and can help patients overcome reduced appetite, digestive issues, changes in taste and smell, and the relationship between emotions and nutrition. Choosing soft and easy-to-chew foods, adopting small and frequent meals, avoiding irritating foods, considering nutritional supplements, and controlling dietary fiber can all provide better support for patients' recovery and help them maintain good nutritional status and quality of life.

## Conclusion

Dietary control plays a crucial role in promoting recovery after lung cancer surgery. Through appropriate dietary strategies, the following three key objectives can be achieved: accelerating healing, reducing the risk of complications, and improving the quality of life, all of which contribute to enhancing the quality of recovery for lung cancer patients.

Post-surgery patients require additional nutritional support to promote wound healing and tissue repair. Proteins, vitamin C, zinc, and other essential nutrients play significant roles in this process. Adequate protein intake facilitates the growth of new tissues, while vitamin C promotes collagen synthesis. Lung cancer surgery may be accompanied by risks of complications such as infections, digestive issues, and respiratory problems. These potential risks can be mitigated by providing comprehensive support to the immune system and promoting healthy digestive functions. Avoiding irritating foods, adopting small and frequent meals, and considering appropriate nutritional supplements all contribute to reducing the risk of complications. Beyond physiological health, dietary control is also related to patients' taste preferences, emotional needs, and overall quality of life. Changes in taste and smell, loss of appetite, and the relationship between emotions and nutrition require special attention. Personalized dietary plans and psychological support can assist patients in overcoming these challenges, ultimately enhancing their quality of life.

In the post-lung cancer surgery recovery process, dietary control is not solely the responsibility of healthcare professionals; it also requires active participation from patients. By achieving reasonable nutritional intake, immune support, and minimizing the risk of complications, we can work together to help lung cancer



Post-surgery, many lung cancer patients may experience discomfort in the mouth and throat, which can make swallowing and chewing more difficult. Therefore, choosing soft and easy-to-chew foods becomes crucial. These foods can alleviate the difficulties in chewing and swallowing while still providing the necessary nutrients [32]. Choices for soft foods include cooked vegetables, softened fruits, cooked grains (such as oatmeal or rice), lean meats (such as chicken or fish), and legumes and legume products. These foods are not only easy to chew but are also rich in protein, vitamins, and minerals, aiding the recovery process. Homogeneous foods such as yogurt, pureed soups, or fruit puree can also be included in the diet. These foods are not only easy to chew but also provide additional liquids and nutrients, helping prevent dehydration and meeting energy needs.

After lung cancer surgery, patients often face reduced appetite and poor appetite. To ensure they receive adequate nutrition, it is recommended to have small, frequent meals. This means dividing meals into more frequent occasions, but with smaller food intake each time. Small, frequent meals can alleviate the patient's stomach discomfort. Large meals may make the stomach uncomfortable, while small meals are easier to digest [33]. It also helps distribute energy and nutrients, ensuring that patients get the required nutrition throughout the day. This is crucial for maintaining stable blood sugar levels and energy supply. Small meals encourage patients to diversify their diet, as they can try different foods without feeling overly full or uncomfortable.

Digestive problems are common in lung cancer patients, so avoiding irritating foods can alleviate discomfort [23]. Irritating foods can lead to stomach discomfort, increased stomach acid, and stomach pain.

Here are some irritating foods to avoid:

**Spicy foods:** Chilli peppers, mustard, and other spicy condiments can irritate the stomach lining, causing discomfort.

**Acidic foods:** Citrus fruits, tomatoes, vinegar, and other acidic foods can increase stomach acid secretion, leading to digestive problems.

**Coffee and tea:** Caffeine can stimulate stomach acid secretion, so it is advisable to limit the intake of coffee and tea.

patients achieve a faster and smoother recovery. This scientifically viable strategy holds the promise of delivering improved recovery outcomes and a higher quality of life for patients.

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