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# A paradigm shift in the treatment of advanced-stage lung cancer

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**Abstract**
In spite of the fact that lung cancer is one of the most prevalent diseases, with an increasing incidence as well as the continued occurrence of morbidity and death, our clinical practice needs to take into account a wide range of factors when determining the most appropriate treatment option for patients.
The advanced stage of lung cancer is the most prevalent type of lung cancer, and it has already spread to other parts of the body, including distant and regional locations. This is especially true in developing nations like Indonesia.
In addition to the fact that surgery is a curative option for these cancers, the advanced stage has a limited reaction whenever we perform a surgical procedure; there are still many opportunities for the tumour to spread and metastasise.
When it comes to these advanced instances, our current perspective is that chemotherapy and radiotherapy have already been announced for several years with unfavourable clinical outcomes, regardless of whether the follow-up is for a short period of time or for a longer period of time.

**Keywords:** Lung cancer, advanced stage, paradigm, treatment

## Introduction

Cancer of the lungs, which is one of the most common diseases in the world, is associated with a high mortality and morbidity rate. Small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC) are the two basic categories that can be used to classify lung cancer. These categories are developed on the basis on the histology of the cancer cells. Non-small cell lung cancer (NSCLC) is the most common subtype of lung cancer, accounting for 85–90% of all forms of lung cancer [1].
There are a number of histological subtypes that are included in the category of non-small cell lung cancer (NSCLC). These subtypes include lung adenocarcinoma (LUAD), lung squamous carcinoma, and large-cell lung cancer. For patients with stage I or stage II non-small cell lung cancer, the treatment consists of adjuvant therapy in conjunction with surgical excision of the entire tumour [2]. Chemotherapy and radiation therapy, on the other hand, are utilised as therapies when the disease has progressed to stages III or IV. However, practically all traditional chemotherapeutic drugs have the same limitations, which reduce their efficiency in treating cancer. These problems include non-specific targeting, poor absorption, and the development of drug resistance.
One of the most important therapeutic approaches for non-small cell lung cancer is molecular targeted therapy. Numerous receptor tyrosine kinases, such as anaplastic lymphoma kinase (ALK), hepatocyte growth factor receptor (c-Met), and epidermal growth factor receptor (EGFR), are essential targets for molecular targeted therapy. This is due to the fact that these kinases play a role in the development and survival of cells. In spite of the fact that the molecular targeted therapy strategy was initially successful, acquired drug resistance is typically the result of tumour heterogeneity and epigenetic change. This greatly affects the therapeutic efficacy in non-small cell lung cancer that is treated with this approach [1, 3].
The use of immunotherapy approaches, such as checkpoint inhibitors, is not only safe and effective, but it also has the potential to offer patients with non-small cell lung cancer alternative treatment options. It is possible that immunotherapy will be advised in particular circumstances when it is combined with other treatments or medications [2, 3]. It is possible that immunotherapy will be advised in particular circumstances when it is combined with other

treatments or medications.

## Treatment

During the course of the last ten years, there have been significant shifts in the therapeutic paradigm for non-small cell lung cancer (NSCLC). This is especially true in light of the introduction of molecular targeted therapy as a key treatment strategy for lung cancer. When it comes to the treatment of lung cancer, there are a number of distinct molecularly targeted drugs that have been created [4].

There have been a substantial number of clinical trials conducted in clinics to examine the efficacy and safety of molecular targeted therapies for lung cancer. These trials have been carried out in order to determine whether or not these therapies are effective [5].

Immunotherapy was a revolutionary technique to treating lung cancer, and is considered to be one of the most inventive methods now available. This strategy featured a number of different approaches, some of which were cancer vaccines, immunocheckpoint inhibitors (ICIs), and cellular immunotherapies. Developing or enhancing immune responses that were effective against tumours was the overriding objective of these various techniques. The fact that immunotherapy was discovered to be related with fewer side effects in comparison to chemotherapy is a finding that is particularly notable. Not only has it been proved to improve the patients' quality of life, but it has also been shown to raise the patients' chances of survival. Immunotherapy served as a realistic way for the treatment of lung cancer. Not only was it effective, but it was also safe, and it demonstrated a promising approach [4, 6].

Molecularly targeted therapy techniques have been introduced, which represent a significant breakthrough in the history of lung cancer treatment. These techniques have resulted in a significant improvement in both the progression-free survival rate and the overall response rate of first-line treatments for patients with lung cancer. On the other hand, the development of drug resistance to molecularly targeted therapy is a challenge that will continue to exist for a considerable amount of time for patients with advanced lung cancer. Either the utilisation of combination medication delivery methods or the identification of fresh pharmacological targets is absolutely required in order to get over this impediment [7].

The application of such strategies will make it possible to design the most effective treatment plans, will support the development of personalised lung cancer treatment, and will ultimately lead to an improvement in the survival rates of patients who have already been diagnosed with lung cancer [5, 8].

The therapeutic options for non-small cell lung cancer that can be surgically removed have experienced some degree of development over the course of the previous two decades.

Immune checkpoint inhibitors (ICIs), either on their own or in combination with chemotherapy, have emerged as the principal treatment choice for patients who have metastatic non-small cell lung cancer. This is the case whether the treatments are administered alone or in combination. In recent years, their clinical development has shifted to the neoadjuvant and adjuvant settings. In these contexts, they have demonstrated outstanding efficacy, which has led to improved clinical results. Recent events have brought about this change. As a result of the positive results that were seen in phase III clinical studies, ICIs have emerged as a potential therapeutic option in neoadjuvant and adjuvant settings. This is because of the fact that they have been shown to be effective in treating cancer. The Food and Drug Administration (FDA) gave its permission for the use of atezolizumab as an adjuvant treatment after surgery and platinum-based chemotherapy in October 2021. This medication is intended for patients who have been diagnosed with non-small cell lung cancer (NSCLC) and whose tumours express PD-L1 at a level of 1% or higher [9].

At the time that it was delivered in March of 2022, the combination of nivolumab and platinum-doublet chemotherapy was given the green light for usage in the neoadjuvant context for adult patients who had resectable non-small cell lung cancer.

## Conclusion

Despite the progress that has been made in medical science, the death rate and prevalence of lung cancer continue to be frighteningly high across the world. It is true that screening and early detection are effective methods for lowering the mortality rate associated with lung cancer.

Despite the fact that our knowledge of the molecular biology and clinical characteristics of lung cancer patients has increased over the course of the last few decades, a treatment that is one hundred percent effective has not yet been discovered. As a result of the numerous restrictions that are associated with conventional chemotherapy regimens for lung cancer, this presents a continuing challenge to the profession of medicine. Furthermore, there is an immediate requirement for therapeutic techniques that are both more effective and better tolerated for the treatment of lung cancer.

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## Informed consent

No need.

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