

## Nursing care for lung cancer patients in the emergency room at dr. Sardjito Hospital

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### Abstract

Lung cancer is the uncontrolled growth of cells in lung tissue that can spread outside the lungs and affect tissue around the lungs and other parts of the body. Cancer is one of the leading causes of death worldwide and is a global health problem that continues to increase every year. Types of lung cancer include Small Cell Lung Cancer (SCLC) and Non-Small Cell Lung Cancer (NSCLC). The purpose of this study is to provide a case report by providing nursing care to patients with ineffective airway clearance in the emergency room of Dr. Sardjito General Hospital. The research method is a case report by providing nursing care to patients, starting from the assessment stage to the evaluation stage. The subject of the report is a patient with a medical diagnosis of lung cancer with a population of 1 patient. This nursing care was provided on June 25, 2024, from 11:30 a.m. to 1:15 p.m. in the emergency room of Dr. Sardjito General Hospital. The patient, Mr. M, aged 58 years, was treated for 1x4 hours in the emergency room with complaints of shortness of breath accompanied by coughing up phlegm, chest pain, and nausea.

**Keywords:** Lung cancer, Airway clearance, Chest pain

### 1. Introduction

The lungs are part of the human respiratory system that plays an important role in meeting the body's oxygen needs, one of which is to function as a place for the exchange of oxygen and carbon dioxide. If the lungs cannot function normally, it will have a negative impact on the respiratory system, one of which is lung cancer. Lung cancer is the uncontrolled growth of cells in lung tissue that can spread outside the lungs and affect surrounding tissues or other parts of the body (Amelia, 2025). Cancer is one of the leading causes of death worldwide and is a global health problem that continues to increase every year.

According to the Global Cancer Observatory (GLOBOCAN), lung cancer ranks first as the leading cause of cancer-related deaths globally, with a high incidence rate in developing countries, including Indonesia. In 2025, there are expected to be 2,260,650 new cases of lung cancer, with an estimated 1,204,730 deaths from lung cancer worldwide (WHO, 2025). In 2022, there were 408,661 new cases of lung cancer in Indonesia, with 242,988 deaths from lung cancer (Globocan, 2022).

Small cell lung cancer (SCLC) is a type of lung cancer that often occurs in heavy smokers but is less common than non-small cell lung cancer (NSCLC), which consists of several types, namely squamous cell carcinoma, adenocarcinoma, and large cell carcinoma. The NSCLC adenocarcinoma subtype is the most common and frequently diagnosed type of lung cancer. Adenocarcinoma and squamous cell carcinoma account for over 60% of all lung cancer cases, significantly impacting lung cancer prognosis through metastasis. Metastasis refers to the spread of cancer cells to other organs outside their original site, the lungs. Metastasis in lung cancer patients with NSCLC adenocarcinoma often occurs in the brain, adrenal glands, and bones (Rianto, 2024).

Clinical manifestations in cancer patients include prolonged coughing, chest pain, shortness of breath, and feeling tired all the time (Alfarisa, 2023). Risk factors for lung cancer include smoking, exposure to radon, pollutants, age, gender, and genetics (Pritami, 2022). Lung cancer management includes chemotherapy, chemoradiotherapy, targeted therapy, antiangiogenic therapy, immunotherapy, and combination therapy (Syazili, 2023).

Hospital services for critical or emergency patients are first handled in the Emergency Room (ER), which is a unit that serves patients who come in with emergency cases, including respiratory emergencies that require assistance. In cases of shortness of breath, first aid is performed at

Emergency Severity Index (ESI) 3 with urgent conditions. Based on the above background, this case report is important to review and discuss under the title “Nursing Care for Lung Cancer Patients with Gas Exchange Disorders in the Emergency Department of Dr. Sardjito General Hospital.”

## 2. Method

The method used was a case study involving nursing care for patients, starting from the assessment stage to the evaluation stage. The subject of this case report was a patient diagnosed with lung cancer, with a population of one patient. Data collection techniques used direct interviews conducted by nurses to obtain subjective data, observation of the patient's physical condition, and a complete physical examination. In addition, supporting data was also needed in the form of documentation studies, such as medical records, laboratory results, and chest radiology results to support the diagnosis. Data sources were obtained from patients, families, observations, physical examinations, and documentation studies. In conducting this case study, nursing ethics principles were upheld, including maintaining patient confidentiality, respecting the patient's right to privacy, and ensuring that all implementations were carried out with the aim of providing benefits without causing harm. This nursing care was carried out on June 25, 2025, at 11:30 a.m. in the Emergency Room of Dr. Sardjito General Hospital in Yogyakarta.

## 3. Results and Discussion

### 3.1. Case Description

The results of the assessment of Mr. M, aged 58, who came to the emergency room on June 25, 2025, with a medical diagnosis of lung cancer. The patient's main complaint was shortness of breath since the night before, which worsened in the morning, accompanied by a cough with phlegm and chest pain when coughing. The patient also reported nausea when coughing continuously but did not vomit. ABCD assessment results: Airway: The airway is patent, with no swelling, edema, or wounds. The patient is able to speak clearly and cough. Breathing: The patient appeared short of breath, was in a tripod position, had additional breathing sounds (wheezing), symmetrical chest wall movement, a respiratory rate of 26 breaths per minute, oxygen saturation of 93% before nasal cannula placement, and 99% after using a 3 lpm nasal cannula. Circulation: Heart sounds are heard as lup-dup at S1 and S2, with no sounds detected at S3 and S4. The patient's skin feels warm with a temperature of 36.5°C, blood pressure is 150/105 mmHg, pulse is 102 beats per minute, MAP is 122 mmHg, and CRT is <2 seconds. Disability: Level of consciousness E4V5M6 compos mentis, pupils isocoric, light reflex positive, and no lateralization of limbs. Exposure: The patient experienced pain when coughing with pain assessment P: when coughing, Q: stabbing, R: left chest, S: 7, T: intermittent.

Secondary examination results: The patient was diagnosed with lung cancer in 2023 and has undergone 6 rounds of chemotherapy. The patient has no history of hypertension, diabetes, or hereditary diseases in the family. Allergy assessment: The patient has no allergies to medications, food, dust, or air. Medication: The patient does not take any regular medication. Post-illness: History of lung cancer since 2023. Last meal: Porridge and warm tea at 9:00 a.m. Event: Shortness of breath since last night accompanied by coughing up phlegm, chest pain, and nausea. Physical examination results on the head: No wounds, edema, bleeding, hair color has turned white, eyes are symmetrical, pupils are isocoric, and light reflexes are positive, ears appear symmetrical and clean. Neck and cervical spine: No wounds found on the neck, no tenderness, no enlargement of the thyroid gland, JVP 5+2 cmH<sub>2</sub>O. Thorax: Symmetrical chest wall movement, additional breath sounds (wheezing), heart sounds heard as lup-dup at S1 and S2. Abdomen: Symmetrical, no wounds, edema, or bleeding, bowel sounds 19 times per minute, no tenderness. Pelvis: No abnormalities. Extremities: No wounds, no pain, peripheral pulses palpable, able to move upper and lower extremities independently, weight 58 kg and height 160 cm.

Supporting examination results in the form of MCT -Thoracic scan showing residual mass in the lateral segment of the right middle lobe, size AP 4.6 x LL 3.7 x CC 2.7, mixed type (nodular and pneumonic) bilateral pulmonary metastasis, left pleural effusion volume 35 mL, paraseptal emphysema in the apicoposterior segment of the left upper lobe, bronchiectasis in the superior and inferior lobes of the left lung accompanied by consolidation and fibrotic lines in both lungs, suggesting old active pulmonary tuberculosis, subcarinal and lower paratracheal lymphadenopathy on

the left, osteoblastic skeletal metastasis in VTh 8 and VL2, and thoracic spondyloarthrosis. Laboratory test results showed erythrocytes 5.56, Hemoglobin 14.9, leukocytes 7.9. Electrocardiogram results showed sinus tachycardia.

### **3.2. Diagnosis and Implementaton**

#### **3.2.1. Clearing the airway**

The first nursing diagnosis established was ineffective airway clearance related to airway spasm, evidenced by shortness of breath accompanied by coughing up phlegm, nausea, and wheezing. It is expected that after nursing interventions for 1x4 hours, airway clearance (L.01001) will be resolved. Nursing interventions for the airway clearance diagnosis included monitoring breathing patterns, monitoring additional breathing sounds, positioning the patient in a semi-Fowler position, administering oxygen with a 3 lpm nasal cannula, teaching effective coughing, and collaborating in the administration of a nebulizer with 2.5 mg combiven.

The nursing evaluation of the results of the implementation of nursing interventions performed on Mr. M's airway clearance problem yielded the following results: Subjective: The patient reported no longer experiencing shortness of breath and reduced coughing, and stated that he would try to apply effective coughing techniques. Objective: The patient was observed using a nasal cannula at 3 lpm, the patient's position was semi-Fowler, no use of accessory breathing muscles was observed, vesicular breath sounds were heard, respiration was 18 breaths per minute, and oxygen saturation was 99%. Assessment: Airway clearance due to airway spasm resolved. P Continue care at home.

#### **3.2.2. Acute pain**

The second nursing diagnosis is acute pain associated with physiological injury agents (neoplasms), evidenced by a stabbing pain in the left chest when coughing, rated at 7 on a scale of 1 to 10. It is expected that after nursing interventions for 1x4 hours, the pain level (L.08066) will improve. Nursing actions for the diagnosis of acute pain include identifying the location, characteristics, duration, frequency, quality, and intensity of pain; identifying the pain scale; providing non-pharmacological therapy to reduce pain using deep breathing techniques; controlling the environment that exacerbates pain (e.g., noise); and recommending the appropriate use of analgesics.

The nursing evaluation of the results of the implementation of nursing interventions for acute pain in lung cancer patients yielded the following subjective results: The patient reported that the pain in the left chest had decreased from a scale of 7 to a scale of 2, and the patient said they would try to apply deep breathing techniques to reduce pain. Objective: P (Chest pain when coughing has decreased, Q (Stabbing pain), R (Left side of the chest), S (Scale 2), T (Intermittent), Assessment: Acute pain due to physiological injury agent (Neoplasm) resolved, Planning: Continue care at home.

### **3.3 Discussion**

The main diagnosis in this case report is ineffective airway clearance due to airway spasm because the patient has complained of shortness of breath since last night, accompanied by coughing up phlegm, chest pain, and nausea. Airway clearance is the inability to clear secretions or airway obstructions to maintain a patent airway (PPNI, 2017). Ineffective airway clearance is caused by tumors/cancer that tend to arise in scar tissue, resulting in obstruction and fluid buildup in the advanced stages. Fluid buildup will cause oxygen supply to the brain, cells, and tissues to be blocked, resulting in oxygen deprivation due to disruption of one of the respiratory organs. The impact of poor secretion clearance is that the patient will experience difficulty breathing and impaired gas exchange in the lungs, leading to cyanosis/bluish discoloration, fatigue, apathy, weakness, and narrowing of the airway, which can cause airway adhesion and obstruction (Albab, 2023).

The action of expelling secretions through effective coughing, which is taught to patients, is one of the interventions implemented to reduce the shortness of breath experienced by patients. Coughing is an involuntary reflex that occurs as a response to stimulation of sensory receptors located from the pharynx to the alveoli (Fracellia, 2024). The application of effective coughing is effective in removing

sputum because it can clear sputum in the airways, increase sputum mobility, and reduce the risk of sputum retention by utilizing symmetrical movements (Ika, 2024).

Patients are advised to drink warm water before performing effective coughing as it can help break down secretions in the respiratory tract, thereby clearing the airways. Physiologically, warm water also affects tissue oxygenation in the body (Lia, 2023). Effective coughing can be done by taking a slow breath and exhaling slowly for 3-4 seconds until you feel calm and comfortable, taking a slow breath and holding it for 3 seconds, lifting your chin slightly and using your abdominal muscles to help exhale with a quick ha-ha-ha sound and opening your mouth. Repeat the effective coughing technique until you feel that there is no more phlegm (Agustina, 2022).

Pharmacological therapy performed on patients with airway clearance disorders involves the collaborative administration of bronchodilators, namely a nebulizer with 2.5 mg of Combivent, which aims to prevent and control the onset of symptoms of shortness of breath or wheezing caused by narrowing of the airways. Bronchodilators can prevent airway obstruction and blockage by thinning phlegm, loosening the airways, and reducing shortness of breath. Thinned sputum reduces inflammation and increases lung ventilation, allowing the respiratory muscles to relax and reducing shortness of breath. Side effects of using Combivent include tachycardia, palpitations, headache, and a hot and flushed face, chest, or neck (Ika, 2024). In addition, nurses also collaborate to administer supplemental oxygen with a nasal cannula at 3 liters/minute. Oxygen therapy is administered to meet the body's oxygen needs adequately and maintain oxygen saturation levels above 95% (Lia, 2023).

The second nursing diagnosis established was acute pain due to physiological injury (neoplasm) because the patient felt pain in the left side of the chest when coughing with a scale of 7. Acute pain is a sensory or emotional experience associated with actual or functional tissue damage, with sudden or gradual onset and mild to severe intensity lasting less than 3 months (SDKI, 2017). Uncontrolled chest pain can cause physiological and psychological problems such as discomfort, hypertension, abnormal heart rate, and anxiety.

Non-pharmacological therapy for chest pain involves deep breathing relaxation techniques. Deep breathing relaxation can help relieve pain by reducing muscle tension and anxiety, focusing the patient's attention on the pain they are feeling to master the deep breathing relaxation technique, thereby increasing oxygen in the tissues and relaxing the brain. A relaxed brain stimulates the body to produce endorphins that block the transmission of pain impulses to the brain and can relieve pain (Pipin, 2023). Deep breathing relaxation is performed by having the client place their hands on their chest, inhale slowly through the nose, hold their breath for three seconds, and exhale slowly through the mouth. Repeat until the client feels relaxed (Andreyansah, 2024).

Deep breathing relaxation therapy has been proven effective in relieving pain experienced by patients because patients can do it independently. The relaxed condition of the skeletal muscles, which were previously tense, is triggered by increased prostaglandin production, which stimulates vasodilation of blood vessels, resulting in increased blood supply to the tense area. In addition, deep breathing stimulates the secretion of endogenous opiates in the form of endorphins and enkephalins through stimulation of the parasympathetic nervous system, resulting in a decrease in cortisol and adrenaline hormones, making it easier for a person to concentrate, calm down, breathe regularly, and increase PaCO<sub>2</sub>, thereby decreasing blood pH and increasing oxygen levels in the plasma (Aprilia, 2023).

#### **4. Conclusion**

Based on the above discussion, it can be concluded that lung cancer can cause shortness of breath accompanied by coughing up phlegm and chest pain. In this case, the patient was diagnosed with ineffective airway clearance and acute pain. The implementation to overcome the diagnosis of airway clearance was to train effective coughing and collaborate in administering bronchodilators in the form of a nebulizer with combivent 2.5. Evaluation of the nebulizer and effective coughing showed that the patient's shortness of breath had decreased, so they were allowed to go home. The implementation of acute pain management involved non-pharmacological deep breathing relaxation techniques because the patient experienced chest pain when coughing. Evaluation of the application of deep breathing relaxation techniques showed that the patient's pain had decreased from a scale of 7 to 2, and the

patient was allowed to go home. A limitation of this report is that it was not permitted to take images of the MSCT-Scan Thorax results due to hospital policy prohibiting the taking of photos or images of patient documents.

## 5. Acknowledgements

We would like to express our gratitude to the field supervisors during our professional nursing education practicum at the Emergency Room (IGD) of Dr. Sardjito General Hospital and our academic supervisors.

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