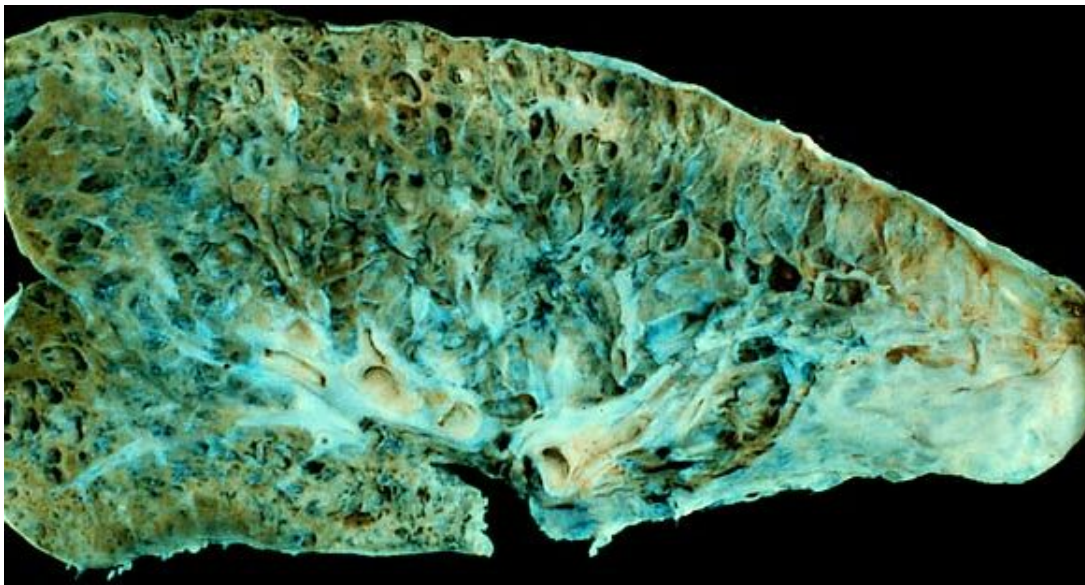


Epidemiology of Lung Diseases

[See online here](#)

Patients presenting with symptoms related to the respiratory system can be challenging to the physician as a number of diseases can overlap in the semiology. For instance, asthma, chronic obstructive lung disease, interstitial lung disease, and inflammatory lung disease can all present with dyspnea. The main differentiating factors between these disorders are the epidemiological and demographic profiles of the patients. Therefore, age, gender, race, and country of origin can all point towards a possible diagnosis. Additionally, certain epidemiological risk factors can help narrow down the differential diagnosis, which includes occupational exposure and smoking history for instance. Moreover, a detailed history and physical examination can help exclude a number of differential diagnoses in the patient without needing any advanced diagnostic testing or imaging modalities.



Important Demographic Findings in Lung Disease

The **patient's age** is very important in the identification of the most likely cause behind respiratory symptoms in the patient. For example, certain conditions such as **asthma** are more likely in children and young adults. On the other hand, **chronic obstructive lung disease** is very unlikely as the cause of dyspnea in a 20-year-old patient.

Other conditions that are more evident in certain age groups include **pneumothorax**, **pneumonia**, and **sarcoidosis** in young adults. Middle-aged adults presenting with dyspnea, **cough** or hemoptysis should be evaluated for possible **malignant lung disease**.

Obstructive sleep apnea and **chronic obstructive lung disease** are other possible

diagnoses behind respiratory symptoms in this age group. The elderly can have **lung cancer**, **pneumonia**, or **interstitial lung disease** as the etiology of their respiratory symptoms.

Gender is another important demographic factor related to certain respiratory conditions. While chronic obstructive lung disease, lung cancer, and **pneumoconiosis** are more common in men, asthma, **pulmonary embolism** and **primary pulmonary hypertension** are more prevalent in women.



Image: "Sarcoidosis - Honeycombing: Prominent honeycombing is present in the lower lobes accompanied by fibrosis and some honeycombing in the upper lungs. " by Yale Rosen. Licence: [CC BY-SA 2.0](#)

Patients presenting with respiratory symptoms who come from India should be investigated for possible **tuberculosis**. Those coming from Africa might have **human immunodeficiency virus infection** and related opportunistic infections as the etiology of their respiratory symptoms.

The race is also an important demographic factor when it comes to respiratory diseases. **Cystic fibrosis**, for instance, is found to be more common among Caucasians. On the other hand, **sickle cell disease**, which can present with acute chest syndrome is more common in African-Americans.

Therefore, part of the routine history taking should note these important factors to narrow down the differential diagnoses. While most of these demographic factors can be known without specific questions, certain parts such as **travel history** and **occupational hazard exposure** should be asked about specifically.

History Taking in Lung Disease

History taking is very important in any patient suspected of having a respiratory disease. The patient's **age, gender, and country of birth** should be noted down before starting history taking.

Formal template for history taking in lung disease

The **presenting complaint** is the first part of the formal history format. It should include the main symptoms of the patient. In other words, the presenting complaint is what brought the patient to you. History of the presenting complaint is a detailed chronological description of the main presenting symptoms.

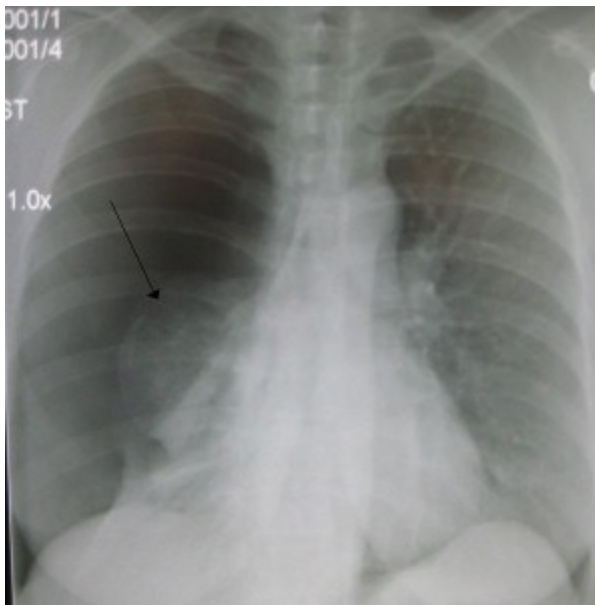
Past medical history can be relevant in many patients presenting with new respiratory

symptoms. Occupational history, smoking status, recreational drug use, travel history, and other related social aspects are important in the identification of the most probable diagnosis.

The next step is to perform a **systemic review of other symptoms** related to other systems finally followed by **recent treatment history** indicating any therapies being taken by the patient.

Presenting Symptoms of Lung Disease

Dyspnea



Chest X-ray showing a pneumothorax on the right (left in the image), where the absence of lung markings indicates that there is free air inside the chest.

Dyspnea is a very important symptom that can be related to either **cardiac or respiratory disease**. It is important to note the **duration, periodicity, progression, and severity** of dyspnea in the patient.

Asking simple questions such as whether it is tolerable to climb the stairs, doing housework, and walking to the market can provide valuable information about the severity of dyspnea.

Additionally, the **speed of onset of dyspnea** can point towards the most likely diagnosis. A sudden onset of severe dyspnea might be related to pneumothorax, thromboembolism, or an asthmatic exacerbation. Episodic dyspnea is more common in asthma and ischemic heart disease. Patients with progressive dyspnea over weeks can have lung cancer, [anemia](#), or complicated pneumonia with pleural effusion. Finally, slowly progressive dyspnea might be related to chronic obstructive lung disease or interstitial lung disease.

Wheezy chest

[Wheezing](#) is another important respiratory symptom that is most likely related to asthma but can be found in chronic obstructive lung disease, bronchiectasis and in large airway

obstruction such as foreign body aspiration. While the chest is diffusely wheezy in asthma, wheezes are usually focal and localized in foreign body aspiration.

Chest pain

Chest pain in respiratory system diseases rarely indicates a serious condition. If the pain becomes constant and progressive over several weeks, **lung cancer** should be suspected especially if the patient is a smoker.

Patients with acute onset chest pain that is pleuritic, sharply localized to one side and exacerbated by inspiration can have **acute pneumonia** or **peripheral pulmonary embolism**.

Central chest pain that comes and goes and is exacerbated by exercise and alleviated by rest is suggestive of **angina** rather than a respiratory condition. A very sudden onset of chest pain that is associated with sudden onset dyspnea can point towards **pulmonary embolism** or **pneumothorax**.

Chest pain that can be localized by a finger can be related to **Tietze syndrome (costochondritis)**. Chest pain that is exacerbated by moving and inspiration but poorly localized might be related to **chest muscle exhaustion** due to chronic cough or chronic lung disease.

Cough and sputum production

Cough is a common respiratory symptom. The most common cause of acute onset cough that lasts few days is **respiratory tract infections**. New and persistent cough in any **smoker** especially if older than fifty years of age is an alarming symptom of possible **lung cancer**.

Patients with persistent cough that is associated with chronic dyspnea might have **chronic obstructive lung disease** or **interstitial lung disease**. Finally, patients who have a chronic cough that is productive might have **chronic bronchitis**, **bronchiectasis** or **asthma**.

Additionally, the type of sputum produced with a cough can have significance in the diagnosis. **Mucoid and yellow sputum** are suggestive of possible asthma. **Hemoptysis** is defined as **coughing of blood** that originates from the lower respiratory tract and can be caused by a lung infection, lung cancer, vasculitis or cardiac-related etiologies. **Purulent sputum that might be foul-smelling** is suggestive of a possible **bacterial infection** etiology.

Patients presenting with hemoptysis should be evaluated to exclude possible life-threatening conditions such as **pulmonary embolism**, **pneumonia**, and **lung cancer**. Patients with these conditions usually have severe chest pain from pleural irritation complicating the presenting picture.

Hemoptysis can also be subdivided into minor and major where major bleeding is defined as coughing of more than 200 ml of blood per day. Possible causes of major hemoptysis include lung cancer, bronchiectasis, and **tuberculosis**. Though the most common cause of minor hemoptysis is chronic bronchitis, patients with chronic obstructive lung disease, acute lung infections, and chronic bronchitis can also present with minor hemoptysis.

Systemic Illness and Lung Disease

In addition to the detailed history of the presenting complaint, **systemic review of other symptoms related to other body systems** can also provide valuable information in diagnosing systemic causes of lung disease. For instance, patients with [anorexia](#), fatigue, unexplained weight loss, and night sweats might have **lymphoma**.

Past Medical History and Lung Disease

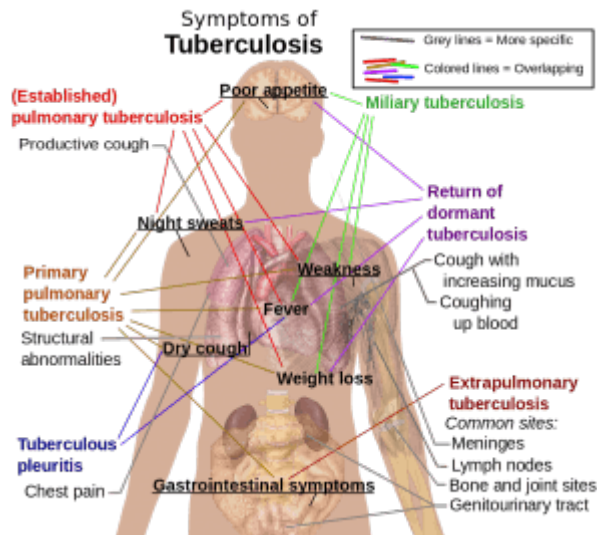


Image: "Symptoms of tuberculosis." by Mikael Häggström.
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Past medical history is also important in patients presenting with a respiratory illness. Previous history of **asthma** puts the patient at an increased risk of developing asthma in adulthood. Past medical history of **ischemic heart disease** can make you suspect angina as the cause behind chest pain or dyspnea in the patient.

Patients with known history of **tuberculosis** infection who have recurrent and progressive cough might have chronic lung damage from tuberculosis or reactivated tuberculosis.

Social History and Lung Disease

In order to be more systemic when asking about **smoking history**, it was suggested to use the **pack years' formula**. By dividing the number of smoked cigarettes per day by 20 and multiplying by the duration of smoking in years one can get the pack years' value for the patient. A value that is above 20 pack-years is clearly associated with a significant risk of chronic obstructive lung disease and lung cancer.

Alcohol abuse is related to an increased risk of [aspiration pneumonia](#) and chronic obstructive lung disease. On the other hand, recreational drug abuse, especially via the intravenous route, might put the patient at an increased risk of [endocarditis](#) which can be fatal and might present with dyspnea and fever.

Family and Drug History and Lung Disease

Certain respiratory conditions are known to have a family factor. Patients with a family history of **allergies**, **atopic dermatitis** and **asthma** are at an increased risk of developing asthma.

Additionally, patients with **cystic fibrosis** usually have a family history of the disease and young adults with emphysema and chronic obstructive pulmonary disease should be screened for **alpha1 antitripsin deficiency**, an enzyme produced by the liver that reduces lung destruction.

Patients who have started **angiotensin-converting-enzyme inhibitors** recently might have cough and dyspnea as a side effect to the drugs. Finally, those with known allergies to penicillins who present with lung infection should be provided with other alternative **antibiotics**.

References

[Respiratory Diseases of Adults](#) via nih.gov

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Notes