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.

Demographics

The **patient’s age** is very important when identifying the most likely cause of respiratory symptoms. For example, certain conditions such as **asthma** are more common in children and young adults, whereas **chronic obstructive lung disease** is very unlikely to be the cause of dyspnea in a 20-year-old patient.

Other conditions that are more common in certain age groups include **pneumothorax**, **pneumonia**, and **sarcoidosis**, which usually affect 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. Elderly patients may have [l lung cancer](https://en.wikipedia.org/wiki/Lung_cancer), [pneumonia](https://en.wikipedia.org/wiki/Pneumonia), or [interstitial lung disease](https://en.wikipedia.org/wiki/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](https://en.wikipedia.org/wiki/Pneumoconiosis) are more common in men, asthma, [pulmonary embolism](https://en.wikipedia.org/wiki/Pulmonary_embolism), and primary [pulmonary hypertension](https://en.wikipedia.org/wiki/Pulmonary_hypertension) are more prevalent in women.

![Sarcoidosis—honeycombing](https://example.com/sarcoidosis-honeycombing.jpg)

Patients presenting with respiratory symptoms who come from India should be investigated for possible [tuberculosis](https://en.wikipedia.org/wiki/Tuberculosis). Those coming from Africa may have [human immunodeficiency virus infection](https://en.wikipedia.org/wiki/Human_immunodeficiency_virus) and related opportunistic infections as the etiology of their respiratory symptoms.

**Race** is also an important demographic factor. [Cystic fibrosis](https://en.wikipedia.org/wiki/Cystic_fibrosis), for example, is more common among Caucasians. On the other hand, [sickle cell disease](https://en.wikipedia.org/wiki/Sickle_cell_disease), which can present with acute chest syndrome, is more common in African Americans.

Therefore, part of routine history taking should note these factors as a way to narrow down the differential diagnoses.

### History Taking

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.

### Formal Template

The **presenting complaint** is the first part of the formal history format. It should include the patient’s main symptoms—that is, what brought the patient to you. The 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 elements are important in the identification of the most likely diagnosis.

The next step is to perform a **systemic review of other symptoms** related to other
Symptoms

Dyspnea

Dyspnea is an 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 a patient can easily climb stairs, do housework, or walk to the grocery store can provide valuable information about the severity of dyspnea.

Additionally, the speed of onset of dyspnea can point to the most likely diagnosis. Sudden onset of severe dyspnea may be related to pneumothorax (see image), thromboembolism, or an asthmatic exacerbation. Episodic dyspnea is more common in asthma and ischemic heart disease. Patients with progressive dyspnea over the course of a few weeks may have lung cancer, anemia, or complicated pneumonia with pleural effusion. Finally, slowly progressive dyspnea may be related to chronic obstructive lung disease or interstitial lung disease.

Wheezing

Wheezing is another important respiratory symptom that is likely related to asthma but can also be found in chronic obstructive lung disease, bronchiectasis, and 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, however, **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 may 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 may indicate **pulmonary embolism** or **pneumothorax**.

Chest pain that can be localized by a finger may be related to **Tietze's syndrome** (costochondritis). Chest pain that is exacerbated by moving and inspiration but poorly localized may 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 a few days is **respiratory tract infections**. New and persistent cough in any smoker, especially if they are > 50 years of age, is a possible symptom of **lung cancer**.

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

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

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, which complicates the presenting picture.

**Hemoptysis** can also be subdivided into minor and major types, where major bleeding is defined as coughing of > 200 ml of blood per day. Possible causes of major hemoptysis include lung cancer, bronchiectasis, and **tuberculosis**. Although 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

In addition to a 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 may have **lymphoma**.
Past Medical History

Past medical history is also important in patients presenting with a respiratory illness. A previous history of **asthma** puts the patient at an increased risk of developing asthma in adulthood. Past medical history of **ischemic heart disease** is suggestive of angina as the cause behind chest pain or dyspnea in the patient.

Patients with a known history of **tuberculosis** infection and who have recurrent and progressive cough may have chronic lung damage from tuberculosis or reactivated tuberculosis (see image).

Social History

When asking a patient about their **smoking history**, the best approach is to use the **pack years’ formula**. Divide the number of cigarettes smoked per day by 20 and multiply this figure by the duration of smoking in years. A value > 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. However, recreational drug abuse, especially intravenously, may put the patient at an increased risk of **endocarditis**, which can be fatal and may present with dyspnea and fever.

Family and Drug History

Certain respiratory conditions are known to run in families. 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. Young adults with emphysema and chronic obstructive pulmonary disease should be screened for **alpha-1 antitrypsin deficiency**, an enzyme produced by the liver that reduces lung destruction.

Patients who have started **angiotensin-converting-enzyme inhibitors** recently may
experience cough and dyspnea as an adverse effect. Finally, patients with known allergies to penicillins who present with lung infection should be given alternative antibiotics.

References

Respiratory Diseases of Adults via nih.gov

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