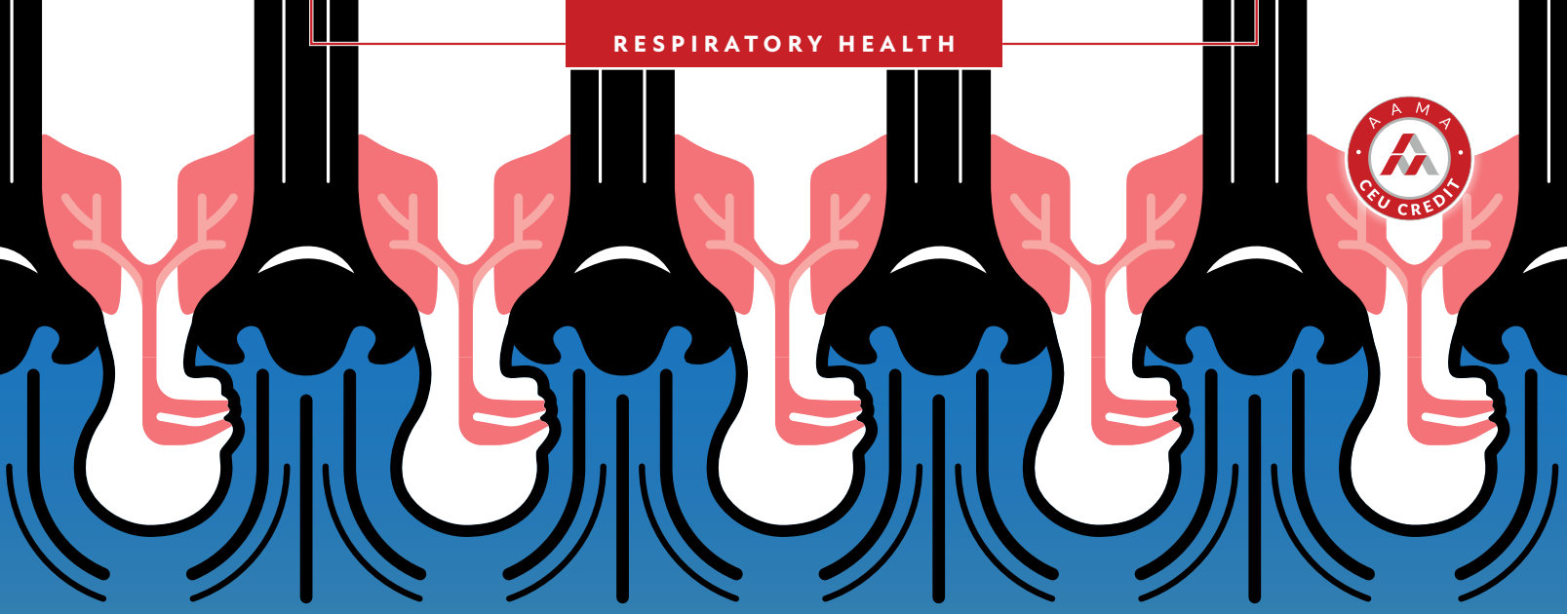

In the Same Breath

The Upper and Lower Respiratory Connection

By John McCormack

Tricia Giese, CMA (AAMA), experiences it all the time. Patients come in and tell her that they woke up suddenly experiencing lung problems. They do not realize that these breathing issues could have started with that seemingly innocuous runny nose or sneeze. So Giese, who works at ThedaCare Medical Center in Shawano, Wisconsin, makes sure that these patients meet with one of the practice's physicians to discuss the crucial connection between the upper and lower respiratory systems.

These providers are likely to echo the thoughts of experts such as Alan D. Workman, MD, MTR, an assistant professor of rhinology and skull base surgery at Harvard Medical School and physician and surgeon at Massachusetts Eye and Ear in Boston. "It's important to think of the upper airway and the lower airway as one continuous tract," explains Dr. Workman. "Things that affect the upper airway can affect the lower airway. Your nose and your sinuses are the first contact with everything that you inhale that will eventually end up in your lungs. And so nasal health is a key component [of] lung health. When nasal function or sinus function has a problem, that can also be reflected in the lower airway in the lungs."

Perhaps most importantly, people must know that nose issues can lead to conditions such as asthma, pneumonia, and chronic obstructive pulmonary disease (COPD).

Airing It All Out

The nose is a vital organ that protects your health. It processes the air that you breathe before it enters your lungs. Most of this activity occurs on and within the turbinates, located on the sides of the nasal passages. About 18,000 to 20,000 liters of air pass through an adult's nose each day.[1]

The nose and lungs (i.e., the upper and lower airways) are linked, which can provide significant insights into respiratory diseases. While the interactions between the upper and lower airways are not entirely understood, this connection is becoming increasingly supported.

Indeed, plenty of anatomical, histological, epidemiologic, pathophysiologic, emerging biomarker, and clinical evidence links the upper and lower airways—particularly as it relates to the most common and chronic airway inflammatory diseases, rhinitis and asthma[2]:

- **Anatomical and histological evidence:**
  - "The nasal and bronchial mucosae consist of ciliary epithelium resting on a basement membrane. Beneath the basement membrane are the lamina propria, glands, and goblet cells."[2]
  - Both the upper and lower airways work together to move air in and out of the lungs.
  - Further, both work together to create a defense system that prevents the inhalation of foreign substances. The nose filters out larger particles, while the lower

Watch Your Mouth

Breathing through your nose is healthier, because it is tied to evolution and the way your nose filters and humidifies the air. If you are more inclined to breathe through your mouth, you may experience problems such as congestion, enlarged adenoids, a deviated septum, or shortness of breath. Breathing through your mouth can lead to the following side effects:

- Snoring or sleep apnea
- Daytime sleepiness
- Chapped lips
- Drooling
- Allergies
- Jaw and facial differences
- Bad breath
- Cavities or gingivitis

Breathing through your nose is more beneficial for myriad reasons:

- Controls the temperature of air entering your lungs, preventing it from being too hot or too cold
- Filters out debris and toxins in the air
- Humidifies the air
- Adds scent to the air, which can protect you by identifying harmful toxins in your air or food
- Limits hyperventilation
- Releases nitrous oxide, which lowers blood pressure and improves oxygen circulation

If you find yourself breathing through your mouth and want to adjust it, speak to a health care provider. They can likely help you identify the reason for your mouth breathing and guide you in adjusting accordingly. This is only necessary if mouth breathing has a negative impact on your quality of life.[6]

airway traps and eliminates any smaller particles that manage to make it through the upper airway.

- **Epidemiologic evidence:** "19–38% of patients with allergic rhinitis … have concomitant asthma and 30–80% of asthmatics have [allergic rhinitis]."[2]
- **Pathophysiologic evidence:**
  - A bone marrow derived systemic inflammatory response may be responsible for communication between the upper and lower airways.
  - The connection is also reinforced by the presence of epithelial basement membrane thickening. This is a hallmark of lower airway remodeling, found in both asthmatic patients and atopic patients without asthma as well as in patients with allergic rhinitis.[2]
  - "In nonallergic asthma, the importance of the presence of IgE in the bronchial mucosa has been highlighted, as in the nasal mucosa in local allergic rhinitis."[2]
- **Emerging biomarkers:**
  - **Microbiome**: Children raised in urban settings more frequently experience allergies than children raised on traditional farms.
  - **microRNA**: The same particular microRNAs are present in different pathogenetic mechanisms of both allergic rhinitis and asthma, such as the IL-13 pathway, GATA binding protein 3, and mucin secretion.[2]
- **Clinical and treatment evidence:**
  - Treating rhinitis can improve asthma symptoms.
  - Intranasal corticosteroid treatment for rhinitis can reduce symptoms of asthma and allergic rhinitis.
  - Leukotriene receptor antagonists have had benefits for patients' long-term management of asthma that was complicated by allergic rhinitis.
  - Allergen immunotherapy has proved effective for treating rhinitis and asthma.

Beyond acknowledging the connection between nose and lung health, people should also be ready to act on this knowledge. "[I] will immediately seek a [physician's] help when I notice that the mucus is starting to settle in my chest, and it also doesn't seem to go away when I take either allergy pills [or decongestants]," says Giese. She encourages patients to do the same.

This is the right course of action because upper respiratory problems can quickly morph into more serious lung issues, according to Dr. Workman. "Upper airway disease can come before lower airway disease. So, if something [starts] in your upper airway, like an infection, it

Medical assistants are in a crucial position to urge patients to ask questions, report all symptoms, and follow care instructions.

can eventually affect your lungs as well. And then lower airway diseases, like asthma [and] other inflammatory lung diseases, can exacerbate problems with your upper airway. And so, if you treat the nose and the sinuses effectively, you may actually improve lung conditions like asthma. So, it's important for patients to be aware—and obviously, medical professionals to be very aware—that these are not isolated systems," he adds.

Allergies, for example, can exacerbate conditions like asthma and COPD. They play a significant role in how severe symptoms and conditions can become. Irritants like pollen, dust mites, and pet dander can set off asthma, causing swelling in the airways.[3]

The problem is that many patients simply fail to make the connection. "Patients who have dealt with chronic nasal disease or chronic lung disease are often acutely aware because they've seen the effects that it's had," says Dr. Workman. "But patients [with] mild seasonal problems or mild asthma may be less aware of the connection between the upper and lower [airways]. And they overlook things like the common cold, an allergy exacerbation, or sinusitis and how those could potentially have an effect on their asthma or lower airway."

The Nose Know-Hows

Health care providers, including medical assistants, need to make a concerted effort to educate patients. Indeed, understanding the nose and lung health connection is key to managing patients' overall health.

Further, health care professionals must encourage patients to meticulously care for their nasal health. As such, providers may, when necessary, need to instruct patients to use saline sprays and rinses to help wash out their nose, as well as to use any prescribed medications.

Additionally, patients who experience recurrent episodes of acute sinusitis must get treatment from either their primary care physician or an ear, nose, and throat specialist. Treatment for chronic sinusitis can include both medical and surgical options. Overall, providers need to ensure that patients understand that early intervention and maintenance therapies can prevent both upper and lower respiratory tract diseases.

Medical assistants can positively impact patients' success in following the physician's orders. If providers have prescribed Flonase, topical steroids, or saline rinses, medical assistants should encourage consistent use of those medications. They can ensure patients understand that they need to use these medications as directed even when their nose feels well. Additionally, medical assistants can remind patients to pay close attention to changes in symptoms between visits and to communicate their observations to the provider. Providers can then appropriately escalate therapy, notes Dr. Workman.

"Overall, allied health professionals can play a key role in helping patients understand the connection between nose and lung health," concludes Dr. Workman. "And then [they can] help patients with preventive habits, early intervention, and medication adherence." ✦

The Breathing Highway

The respiratory tract, from the nose to the lungs, is a continuous system consisting of three main components, according to the *Chinese Journal of Otorhinolaryngology-Head and Neck Surgery*[4]:

- The nasal cavity, which serves as the "entrance ramp" and filters dust and pollen, regulates air temperature and humidity, and protects downstream precision components.
- The trachea and bronchi serve as the "main roads" of the highway.
- The lungs are the final destination.

As such, problems that start in the nose can lead to more serious lung issues, such as asthma, bronchitis, and COPD.

COPD Management Strategies

People with chronic obstructive pulmonary disease (COPD) need to understand how allergies affect their health. Common household allergens such as pollen, dust, mold, and pet dander can irritate the airways and make COPD symptoms, such as shortness of breath and persistent cough, more severe.

Patients with COPD—and asthma—can manage their allergies to improve their lung health. One way to do this is to avoid allergens inside your home by taking the following precautions[3]:

- Using air filters to clear the air of allergens
- Keeping windows closed when pollen is high
- Cleaning and dusting regularly to prevent dust mites and mold
- Avoiding smoke, which is particularly harmful to those with asthma and COPD
- Following an allergy plan provided by your physician

The CE test for this article can be found on page 28.

Asthma Versus COPD

Asthma and chronic obstructive pulmonary disease (COPD) both commonly cause breathing problems. Both conditions are characterized by coughing, shortness of breath, and limited airflow. However, each of these conditions requires its own unique approach to care.

A health care provider helps patients determine whether they have COPD or asthma. Typically, people with COPD have a history of smoking and are older, whereas asthma can appear in younger patients with no history of smoking.

Sometimes the line can be blurred between the two conditions, because COPD may occur in patients who have never smoked, asthma can be diagnosed later in life, and comorbidity can exist between the two conditions.

One differentiating factor between the two is that asthma symptoms typically appear as attacks that range from mild to severe. Between these attacks, the person may face no breathing difficulties. Common triggers of asthma attacks include allergies, cold air, exercise, respiratory tract infections, tobacco smoke, and stress.

Patients with COPD are more likely to have symptoms constantly. Exacerbations may occur, but usually only when the patient experiences a respiratory tract infection. In these cases, the individual may require hospitalization and may experience further lung damage.

Health care providers do not yet know why people develop asthma when they do, but it is likely due to a combination of environmental exposures and genetics. The main cause of COPD is smoking, but it can also be caused by breathing in harmful chemicals or an inherited condition called alpha-1 antitrypsin deficiency.

While quitting smoking is the most crucial treatment strategy for COPD and asthma, the two conditions have other treatment options that differ:

- **Asthma:** Use short- or long-acting bronchodilators (inhalers), inhaled corticosteroids, and oral steroids or injected medications, as well as avoid triggers (e.g., pet dander and mold).
- **COPD:** Avoid smoke, get immunizations, follow a healthy diet, increase physical activity, and manage other health conditions (e.g., sleep apnea and heart disease).[5]

References

1. Your nose, the guardian of your lungs. Boston Medical Center. Accessed February 15, 2026. https://www.bmc.org/your-nose-guardian-your-lungs
2. Licari A, Castagnoli R, Denicolò CF, Rossini L, Marseglia A, Marseglia GL. The nose and the lung: united airway disease? *Frontiers Pediatr*. 2017;5. https://doi.org/10.3389/fped.2017.00044
3. Marga. Allergies and respiratory diseases: understanding the connection. Careyourlungs. November 29, 2024. Accessed February 15, 2026. https://careyourlungs.com/allergies-and-respiratory-diseases-understanding-the-connection/
4. Are nose problems killing your lungs? Doctors warn: ignore rhinitis and the next step will be asthma. iMedia. Accessed February 15, 2026. https://min.news/en/health/91ebb50e180b1afaa42875c142e15a94.html
5. Understanding the difference between asthma and COPD. Cleveland Clinic. January 10, 2024. Accessed February 15, 2026. https://health.clevelandclinic.org/asthma-vs-copd
6. Nose breathing vs. mouth breathing: which is better? Cleveland Clinic. July 25, 2024. Accessed February 15, 2026. https://health.clevelandclinic.org/breathe-mouth-nose