

Beyond the stethoscope: Respiratory assessment of the older adult

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RESPIRATORY ASSESSMENT of an older patient requires you to have clinical knowledge, skills, and competence in the age-related changes found in this population. Normal aging may result in structural changes to the chest wall or thoracic spine that can limit chest expansion, decreased respiratory muscle strength that may interfere with effective airway clearance by coughing, and increased physiologic demand, such as in pneumonia or heart failure, that may lead to a poor compensatory response to hypoxia.

In this article, I'll help you expand your assessment techniques beyond the stethoscope and differentiate between normal and abnormal respiratory findings in the older adult.

History collector

A comprehensive respiratory assessment includes gathering a medical history that may impact or explain physical assessment findings. The older adult has a long history that may include smoking or exposure to secondhand smoke, environmental exposures to asbestos or other pollutants, and illnesses such as chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), or pneumonia. Ask your patient about his energy level, functional abilities, and independence, and inquire about symptoms such as coughing and sputum production because the timing of a cough and the characteristics of sputum may indicate specific problems. A nocturnal cough may be a sign of pulmonary edema associated with CHF, which sometimes produces pink-tinged or frothy sputum; rust-colored

or currant jellylike sputum may indicate pneumonia.

This is also a good time to find out if your patient has been vaccinated against influenza and pneumonia, and to provide education on the benefits of vaccination for older adults. Remember that the influenza vaccination should be given annually, while the pneumococcal vaccine should be given just once to adults over age 65. If your patient was vaccinated before age 65, he'll need to be vaccinated again 5 years after the initial vaccination.

Inspect and observe

Begin your physical assessment by observing your patient's respiratory rate, effort, and function. Count his respiratory rate; expect 12 to 24 breaths/minute. Look for signs of increased respiratory effort, such as mouth breathing or accessory muscle use, and measure his oxygen saturation level. Observe the shape and symmetry of his chest. The normal adult thorax is wider (transverse diameter) than it's deep (anterior to posterior diameter). An older adult may have developed a barrel chest due to COPD or kyphosis (curvature of the upper spine) due to bone degeneration, which may reduce chest expansion. Observe for shortness of breath with and without exertion and orthopnea (the need to be in an upright or forward leaning position to get an adequate breath), which is often seen in patients with COPD. Check his mucous membranes, skin color, and mental status as indicators of effective oxygenation.

If your patient has an increased respiratory rate, dyspnea, accessory muscle use, or an

Check out
these tricks
of the trade.



oxygen saturation level of less than 90%, initiate oxygen therapy and notify the health care provider of your assessment findings. Keep him comfortable by allowing him to sit upright, administer medications or breathing treatments as ordered, and provide emotional support to reduce anxiety associated with dyspnea. Educate him about breathing and relaxation techniques and energy conservation.

The next steps in your physical assessment include palpation, percussion, and auscultation. Let's take a closer look.

Hands on

First, palpate your patient's back at the level of the tenth rib with your thumbs on each

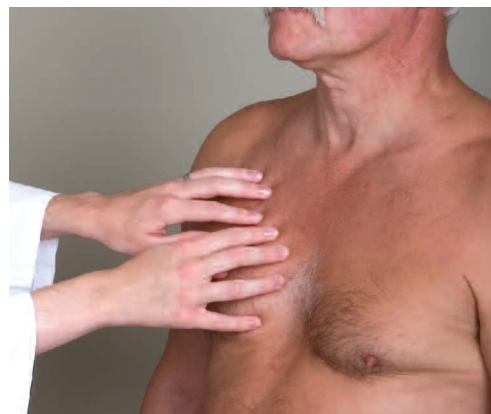
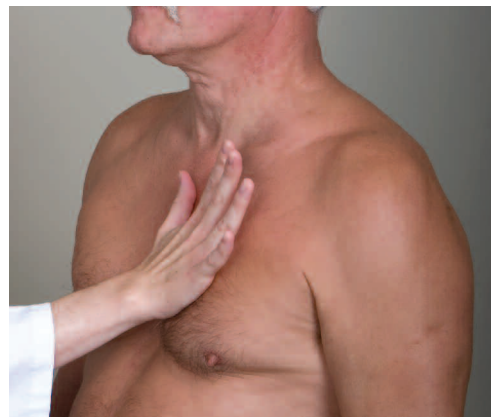
side of the spine and your fingers spread laterally. Ask him to take deep breaths as you assess the adequacy and equality of lung expansion by watching your hands move up and apart during each breath. A patient with an area of consolidation, as seen with conditions such as pneumonia and tumors,

may have reduced lung expansion on the affected side resulting in minimal or absent movement of your hand. Reduced lung expansion may also be a sign of pneumothorax.

Then ask your patient to fold his arms across his chest while you place your open palms on both sides of his back without touching his back with your fingers. Ask

him to say "ninety-nine." You'll feel a very slight vibration each time your patient speaks; however, if there's an area of consolidation, the vibration will feel more intense because fluid transmits sounds and vibrations better than air-filled lungs. Notify the health care provider if you suspect lung consolidation or pneumothorax.

To evaluate your patient's thorax, place your palm (or palms) lightly over the thorax and palpate for tenderness, alignment, bulging, and retractions of the chest and intercostal spaces. Repeat this procedure on his back. Then use the pads of your fingers





memory jogger

While inspecting his chest, look for these characteristics that may put a **CRAMP** in your patient's respiratory system.

Chest-wall asymmetry

Respiratory rate and pattern (abnormal)

Accessory muscle use

Masses or scars

Paradoxical movement

to palpate the front and back of the thorax. Pass your fingers over his ribs and any scars, lumps, lesions, or ulcerations. Note the temperature, turgor, and moisture. Muscles should feel firm and smooth.

Percussion please

Next, perform percussion by tapping on your patient's chest wall. Begin by using the middle finger of your nondominant hand and placing it on his chest or back. Don't make contact on his skin with your other fingers or the palm of your hand because this diminishes the vibrations you're trying to create. Strike your finger briskly with the index or middle finger of your dominant



hand in the intercostal spaces on each side of his chest or back.

Listen for sounds with these characteristics:

- **flat**—a short, soft, high-pitched, and extremely dull sound as heard over bone or muscle; indicates consolidation, such as in atelectasis or extensive pleural effusion
- **dull**—a thudlike sound as heard over solid organs such as the liver; may replace resonance in the lungs when fluid is present as in pneumonia
- **resonant**—a long, loud, low-pitched, and slightly hollow sound as heard over the lungs or abdomen; indicates bronchitis
- **hyperresonant**—a very loud, lower-

pitched sound as heard over the stomach; indicates a hyperinflated lung as in emphysema or pneumothorax

- **tympanic**—a loud, high-pitched, drum-like sound as heard over a puffed-out cheek; indicates excess air as in a large pneumothorax.

Listen up!

Last, auscultate your patient's back, chest, and sides to listen for the presence of normal and adventitious (abnormal) breath sounds. For the chest auscultation sequence, see "Every breath you take: Making sense of breath sounds" from our January/February 2007 issue. Normal breath sounds include:

- **tracheal**—high-pitched, harsh tubular sounds heard over the trachea and throat
- **bronchial**—high-pitched tubular sounds (less harsh than tracheal sounds) heard over the large airways of the chest
- **bronchovesicular**—tubular sounds (not as loud as bronchial sounds) best heard posteriorly between the scapulae
- **vesicular**—low-pitched, soft blowing sounds heard throughout the lung fields that occur throughout inspiration and fade one-third of the way through expiration.

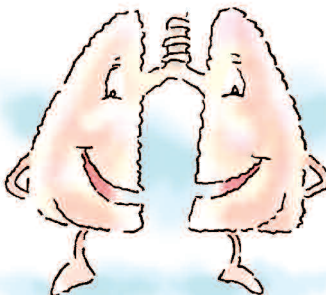
If you hear bronchial or bronchovesicular sounds over the lung periphery where these sounds aren't typically heard, suspect pneumonia or tissue consolidation.

Adventitious breath sounds include:

- **crackles** (course or fine)—discontinuous popping or bubbling sounds that occur when air is forced through fluid-filled airways, causing the airway to suddenly open; if you hear crackles, suspect pulmonary edema, chronic CHF, or pneumonia
- **wheezes** (sonorous or sibilant)—musical sounds that occur when air moves quickly through mucus-filled, narrowed airways, heard on inspiration or expiration; if you hear wheezes, suspect pulmonary disease, such as asthma, COPD, or an acute allergic reaction
- **pleural friction rub**—a creaking or grating sound caused by the inflamed pleural surfaces rubbing together; sometimes heard in the presence of pneumonia.

For more information about abnormal

The sounds we make can help you determine what's wrong with us.



Auscultation findings for common disorders

Disorder	Auscultation findings
Asbestosis	<ul style="list-style-type: none"> • Bronchial sounds in both lung bases • High-pitched crackles heard at the end of inspiration • Pleural friction rub
Asthma	<ul style="list-style-type: none"> • Diminished breath sounds • Musical, high-pitched expiratory polyphonic wheezes • With status asthmaticus, loud and continuous random monophonic wheezes, along with prolonged expiration and possible silent chest if severe
Atelectasis	<ul style="list-style-type: none"> • High-pitched, hollow, tubular bronchial breath sounds, crackles, and wheezes • Fine, high-pitched, late inspiratory crackles • Bronchophony, egophony, and whispered pectoriloquy when right upper lobe is affected
Bronchiectasis	<ul style="list-style-type: none"> • Profuse, low-pitched crackles heard during mid-inspiration
Chronic obstructive pulmonary disease	<ul style="list-style-type: none"> • Diminished, low-pitched breath sounds • Sonorous or sibilant wheezes • Inaudible bronchophony, egophony, and whispered pectoriloquy • Prolonged expiration • Fine inspiratory crackles
Pleural effusion	<ul style="list-style-type: none"> • Absent or diminished low-pitched breath sounds • Occasionally loud bronchial breath sounds • Normal breath sounds on contralateral side • Bronchophony, egophony, and whispered pectoriloquy at the upper border of pleural effusion
Pneumonia	<ul style="list-style-type: none"> • High-pitched, tubular bronchial breath sounds over the affected area during inspiration and expiration • Bronchophony, egophony, and whispered pectoriloquy • Late inspiratory crackles not affected by coughing or position changes
Pneumothorax	<ul style="list-style-type: none"> • Absent or diminished low-pitched breath sounds • Inaudible bronchophony, egophony, and whispered pectoriloquy • Normal breath sounds on contralateral side
Upper-airway obstruction	<ul style="list-style-type: none"> • Stridor • Decreased or absent breath sounds • Wheezing

breath sounds, see *Auscultation findings for common disorders*.

An older adult with pneumonia or consolidation may also have abnormal voice sounds such as bronchophony. Assess this by having your patient say “ninety-nine” as you auscultate his lungs. In air-filled lungs the words will sound muffled and indistinguishable. When auscultating over an area of fluid or consolidation, the words will sound unusually loud. Suspect pneumonia if bronchophony is present.

Go beyond

When caring for an older patient, you must be able to gather and interpret physi-

cal assessment data beyond the stethoscope, incorporating knowledge of changes that may affect him to determine the most appropriate interventions in his care. ■

Learn more about it

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