By Jeff Nichols, MD, CMD

CARING FOR THE AGES • 7

Take a Deep Breath and Hold It

Dear Dr. Jeff: We have been trying to decrease our rate of hospital admissions and readmissions. The local hospitals have all emphasized readmissions for congestive heart failure and we have had significant success reducing these hospital referrals, but our data now show that respiratory diseases are the most common reason for our short-term and long-term residents to go to the emergency department. We have so far been unable to influence these numbers. Do you have any suggestions?

Dr. Jeff responds: Unfortunately, chronic obstructive pulmonary disease (COPD) can be very difficult to diagnose or evaluate in seniors as no elder-specific diagnostic criteria exist. Although the symptoms of chronic cough and shortness of breath that increase with exercise are both very common in the elderly, they obviously overlap with many other diagnoses, such as congestive heart failure (CHF) and recurrent aspiration.

The GOLD Standard
The Global Initiative for Chronic Obstructive Lung Disease (GOLD) produced internationally accepted standards for diagnosis and treatment. Their diagnostic and treatment guidelines define COPD as an FEV1 (forced expiratory volume in 1 second) to FVC (forced vital capacity) ratio of less than 0.7, an arbitrary value. This means that the patient requires a longer time to exhale, implying an obstruction to airflow. Consequently, a COPD diagnosis can only be made using spirometry, a diagnostic test that is generally unavailable in nursing homes — although not uncommon in many primary care physician offices — and nearly universal for pulmonology specialists.

Moreover, spirometry is rarely performed during acute hospital care because accurate measurements should be obtained when the patient is at baseline as opposed to the acute or recovery phase of a respiratory infection. Thus, for most nursing homes to make a diagnosis according to the GOLD standard, a transfer of the patient outside the building with all the attendant difficulty and costs is required. Also, for patients with concomitant dementia, it may be difficult to get them to blow as hard and as long as they can into a spirometer.

Unfortunately, pulmonary function declines with age due to complex interactions among a variety of factors. These factors include exposure to respiratory toxins, such as tobacco smoke; age-related decline in cell repair with enlargements of alveolar size (“senile emphysema”); decreased lung elasticity; and changes in immune function promoting pulmonary inflammation including inflammatory markers, such as tumor necrosis factor-alpha and IL-6.

Further, normal breathing requires the activity of muscles including aging intercostal muscles, which may be further limited by increased spinal rigidity, chest wall structural changes, such as kyphosis, and declining diaphragmatic strength. Those factors associated with sarcopenia in frail seniors probably play a role for muscles such as the diaphragm.

In summary, there are multiple reasons to suspect that COPD is seriously underdiagnosed in frail seniors in the long-term care setting. Unfortunately, even when cognitive function allows for spirometric testing, there is significant potential to overdiagnose normal systems with disease processes, such as COPD, leading to inappropriate treatment with medications associated with serious toxic side effects in the elderly. For example, CHF can produce wheezing, low-grade leukocytosis, elevated temperature, and increased interstitial markings or pseudo-infiltrates on chest X-rays, all suggestive of decompensated chronic lung disease. Also, because prior or ongoing tobacco use is a major risk factor for both cardiac and pulmonary dysfunction, there is significant overlap in at-risk populations. Moreover, in an era when 30-day readmissions for CHF lead to potential financial penalties for hospitals, there is ample reason that return of a patient — who has failed to respond to outpatient management — to the hospital after a prior cardiac admission may be attributed to a new or different disease process, such as COPD.

Assess All Breathing Difficulties
Residents should routinely be asked about shortness of breath, including whether shortness of breath occurs during exercise, and whether it limits activities of daily living or extended ambulation. Clinicians should not be satisfied with cardiac or respiratory patients who only are asymptomatic at rest. Obviously, these are likely to be undertreated patients at risk of hospitalization with any acute physiologic decline.

The physical examination offers significant clinical information. Auscultation during forced exhalation is a poor doc’s spirometry. The resident should be asked to take a deep breath, hold it, and breathe out as rapidly as possible. This maneuver frequently produces expiratory wheezing that would not be audible during the slow inhalation/exhalation of the traditional lung exam. Moreover, the practitioner can determine whether the expiratory process is prolonged or extremely prolonged, compared with their experience or the patient’s baseline. Although portable spirometry equipment is more affordable now, and could be brought to the bedside, patients may have difficulty complying with instructions. Thus, values obtained may be poorly reproducible.

Treatment Missteps, Options
There is ample evidence that elderly patients are routinely undertreated and inappropriately treated for COPD. Metered-dose inhalers (MDIs) are still frequently ordered in skilled nursing and assisted living facilities, despite substantial evidence that they are ineffective for patients in these settings. Successful use of an MDI requires coordination between a strong forced inhalation and compression of the canister. Arthritic fingers, cognitive impairment, weak inhalation, and the need to coordinate with an administering nurse suggest that these medications are delivered only to the oral cavity. When the inhaler includes a steroid, this also increases the risk of thrush. Coordinated use of an MDI may be particularly problematic when administered to a resident who is already tachypneic. MDIs should rarely be used in nursing homes without a spacer and very rarely used outside post-acute units. Dry powder inhalation devices, breath-activated delivery systems, and soft mist inhalers are all more effective than MDls with a spacer. Of all these devices, the use of nebulizers requires the least coordination and the least inspiratory effort, although they require more nursing time.

The GOLD treatment recommendations emphasize the use of inhaled anticholinergic preparations. Generally well-tolerated in the elderly, they are minimally absorbed systemically but may add to the resident’s general anticholinergic load, increasing the risk of cognitive side effects. Obviously, their use in any patient already treated with cholinesterase inhibitors, such as donepezil, requires close monitoring. Also, some risk exists of ocular exposure when used for residents with glaucoma.

Beta-adrenergic preparations have been the mainstay of COPD treatment in the elderly. Despite evidence of decreased physiologic effect with aging related to binding site alterations, beta-adrenergic preparations remain clinically effective, and there is little reason to favor one preparation over another. Long-acting preparations should be preferred for stable pulmonary function, and short-acting preparations should be reserved for treatment of breakthrough symptoms.

Inhaled corticosteroids should be considered for those with moderate-to-severe disease. Their use in a disease with reversible inflammatory features is logical and strongly urged by the GOLD criteria. Theophylline, which lost popularity due to the need to monitor drug levels and the nausea associated with high doses, can still be an effective addition to the regimen of patients with advanced disease.

As with so many chronic diseases, effective management means chronic treatment and the prevention of exacerbations. Prevention of exacerbations and rehospitalization also requires evaluation and treatment of the coexisting depression with anxiety, which has been found in more than 40% of seniors with COPD. This anxiety may be worsened by adrenergic agents or steroids, but it is not simply a side effect of therapy.

Pulmonary rehabilitation plays a role in the recovery from acute decompensation and the prevention of recurrences. A comprehensive approach to pulmonary rehabilitation includes breathing exercises; optimizing adjunctive equipment, including incentive spirometers and CPAP/BiPAP equipment; patient education; and co retraining with physical therapy and occupational therapy, including monitoring of oxygen saturation during treatment. Unfortunately, Medicare does not recognize respiratory therapy time as it does other therapies in RUGs (resource utilization group) reimbursement categories. Given the rising costs to hospitals from recurrent hospitalizations, it may be possible to investigate coinvesting in a pulmonary rehab program shared between acute and post-acute care.

Underdiagnosed and overdiagnosed, undertreated and poorly treated, COPD is a chronic condition that can rapidly turn life-threatening, and it can result in a trip to the hospital or intensive care unit. Yet, appropriate treatment, including wise choices, patient education, and early interventions, can prevent or blunt severe exacerbations. When directing patients through forced expiration, many clinicians describe forced expiration as “like blowing out birthday candles.” With good care, these patients may see more candles on their cake.