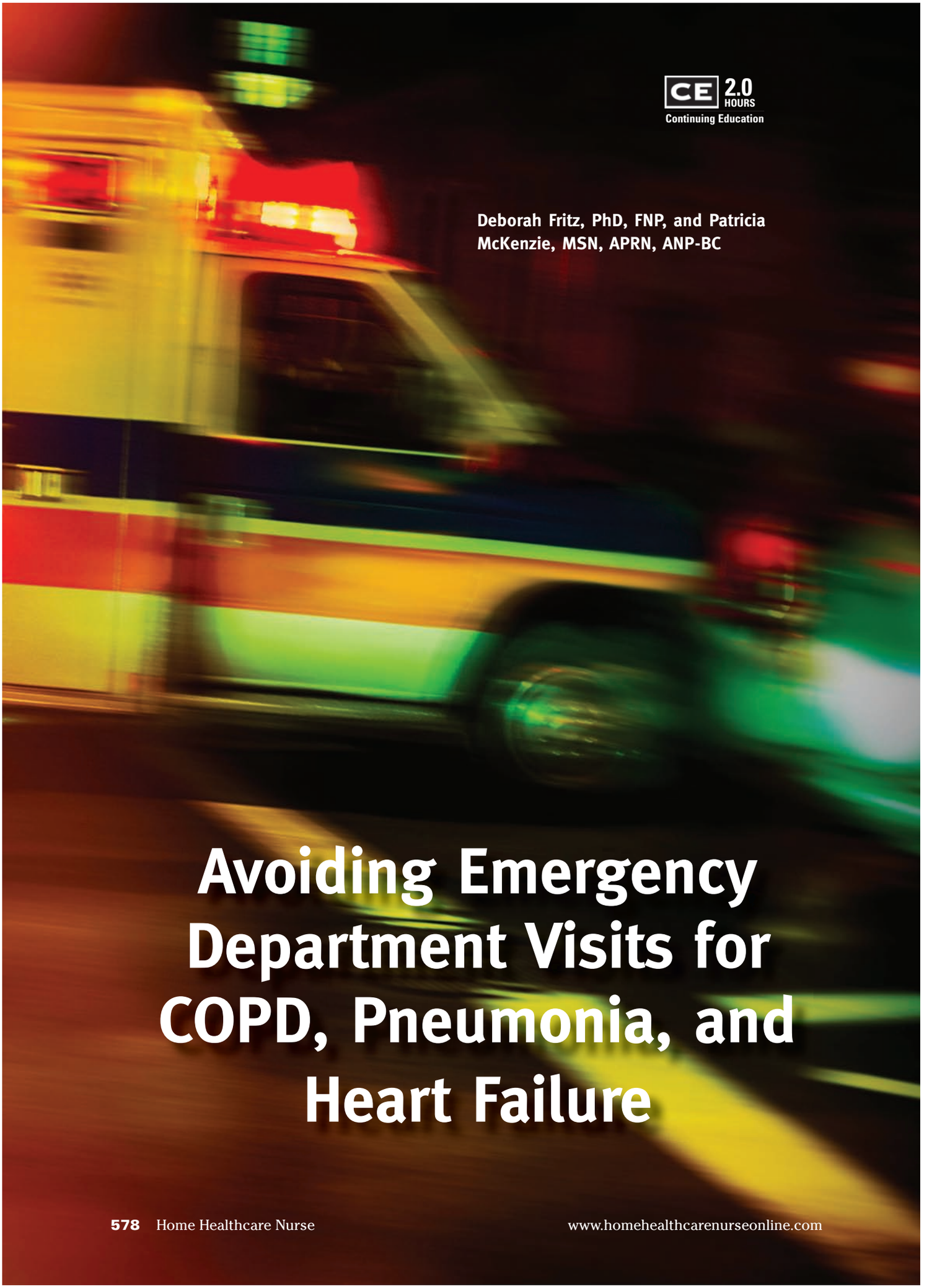

CE 2.0 HOURS
Continuing Education

Deborah Fritz, PhD, FNP, and Patricia McKenzie, MSN, APRN, ANP-BC

Avoiding Emergency Department Visits for COPD, Pneumonia, and Heart Failure

When Should Patients Go to the Emergency Department?

Patients with pneumonia, chronic obstructive pulmonary disease (COPD), and heart failure make frequent visits to the emergency department. Heart failure alone is the reason for more than 1 million emergency department visits annually in the United States. This article describes strategies home care clinicians can use to prevent unnecessary emergency department visits for patients with pneumonia, COPD and heart failure.


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In North America, there are more than 1 million visits to the emergency department (ED) for acute heart failure (HF) per year, and heart disease remains the number one cause of death. Risk for morbidity is 30% greater for persons with heart disease over the age of 65 years (American Heart Association, 2010). Respiratory conditions such as chronic obstructive pulmonary disease (COPD) and pneumonia also account for a large number of ED visits, with pneumonia being number one for ED visits, which resulted in a hospital stay (Man et al., 2011). New recommendations place an increased emphasis on improving healthcare education and behaviors to maximize self-care strategies. This article highlights methods to increase healthy behaviors and maximize the healthcare of persons with chronic COPD and HF, and for persons at risk for community-acquired pneumonia. Strategies to avoid ED visits and hospitalization must take into consideration the complexities of managing multiple concurrent disease processes, as well as the difficulties of self-management in the elderly patient.

COPD

COPD is the third most common cause of death in North America, with estimates that 10% of all individuals 65 years and older have COPD (Morbidity and Mortality Weekly Report, 2012). It is predicted that COPD will become the third leading cause of death worldwide by 2020 (Hoyert & Xu, 2012). COPD includes asthma, chronic bronchitis, and emphysema. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) provides guidelines for pharmacologic and nonpharmacologic therapies including smoking cessation, reduction of other risk factors (Box 1), vaccinations, and pulmonary rehabilitation (GOLD, 2014). The good news is that only 18% of U.S. adults continue to smoke, which is a significant improvement from 24.7% in 1997 (Centers for Disease Control and Prevention [CDC], 2013a).

Case Study

Mr. B is a 66-year-old man with an 80-pack year history of cigarette smoking who still enjoys an occasional cigar. Until recently, he was able to play golf using a cart, but his shortness of breath no longer allows for much physical activity. His wife states he frequently sleeps in a chair because of trouble breathing, and he has little appetite for food. In addition, he has moderate osteoarthritis of both knees and hands, with morning stiffness that usually improves over the course of the day. He initially used albuterol by metered-dose inhaler (MDI) as needed but has progressed to the following medications:

- Ipratropium (Atrovent), 2 puffs 4 times per day;
- Albuterol, 2 puffs 4 times per day, as needed;
- Salmeterol, 50 mcg twice daily;
- Methotrexate (Rheumatrex), 7.5 mg per week; and
- Tylenol Extra Strength twice daily as needed (PRN) pain.

Discussion

Elderly persons are particularly susceptible to lower respiratory infections. Clinical outcomes depend heavily on age, functional status, and the general health of the individual. Seventy to eighty percent of COPD exacerbations are secondary to respiratory infections, bacterial or

Box 1. Risk Factors for Chronic Obstructive Pulmonary Disease (COPD) Exacerbation

- Recent oral or respiratory infection
- Smoking, second-hand smoke, air pollutants
- Chronic oral corticosteroid use
- Advanced age
- Productive cough
- Duration of COPD
- History of antibiotic therapy
- COPD-related hospitalization within the previous year
- One or more comorbidities such as heart disease or diabetes
- Gastroesophageal reflux disease

viral, including influenza. At this time there is insufficient evidence to recommend antibiotics daily or pulsed to avoid infections, but this may be used in carefully selected patients (Mackay & Hurst, 2012). According to Hurst et al. (2010) the "best predictor of exacerbation is history of exacerbations" (p. 1134). Exacerbations generally include one or more of the following cardinal symptoms beyond normal day-to-day function or usual stable state: increased cough, increase in sputum volume or change in usual character, and increased shortness of breath (GOLD, 2014). In mild exacerbations, only one of the three cardinal symptoms is present. In moderate to severe, two of three cardinal symptoms are present (GOLD, 2014).

Acute exacerbation management requires:

- Verifying compliance and adequacy of current medications especially inhalers,
- Increasing current medications to maximal doses, and
- Consider adding additional medications such as antibiotics, oral steroids, and/or oxygen.

Not all ED visits can be avoided. Changes in mental status are suggestive of hypoxemia and indicate more severe problems, which may require hospitalization. The inability to eat or sleep because of increased symptoms and a marked increase in symptoms that do not respond to initial medical management are also indications for ED assessment and possible admission (GOLD, 2014). There is an increase in mortality following hospitalization for COPD exacerbation, so if patients can be managed at home, they tend to do better. A meta-analysis of seven trials suggested that home care for COPD exacerbation was equal to hospitalization at a substantially reduced cost (Ram et al., 2004). Home care in these studies included nurse visits, home oxygen, and physical therapy for highly selected patients. Deciding whether hospitalization or home care is appropriate depends on multiple factors (Table 1).

Self-Care Strategies for Prevention of COPD Exacerbation

- Mark on a calendar each time an MDI is used. Increased PRN use may be the first clue that there is an increase in shortness of breath;

Table 1. Factors to Consider When Deciding Where to Treat the Patient With COPD [Chronic Obstructive Pulmonary Disease] Exacerbation

Factor	Treat at Home	Treat in Hospital
Able to cope at home	Yes	No
Breathlessness	Mild	Severe
General condition	Good	Poor/ Deteriorating
Level of activity	Good	Poor/Confined to bed
Cyanosis	No	Yes
Worsening peripheral edema	No	Yes
Level of consciousness	Normal	Impared
Already with oxygen therapy	No	Yes
Social circumstances	Good	Living alone/ not coping
Acute confusion	No	Yes
Rate of onset	Insidious/ Gradual	Rapid
Significant comorbidity (cardiac disease or insulin-dependent diabetes)	No	Yes
Oxygen saturation <90%	No	Yes

Source: National Institute for Health and Care Excellence (2013) *Managing exacerbations of COPD*. London: NICE. Available from www.nice.org.uk Reproduced with permission.

Changes in mental status are suggestive of hypoxemia and indicate more severe problems, which may require hospitalization.

- Ensure proper use of inhalers and when to refill; consider changing MDI to nebulizer therapy;
- Promote oral hygiene and periodontal health to avoid bacterial infections;
- Prevent complications of immobility by increasing exercise (Ochmann et al., 2012);
- Address nutritional needs to decrease risk of infection; monitor weight weekly; monitor body mass index;
- Assure adequate oxygenation and secretion clearance and avoid cough suppressants;
- Teach patients to avoid other persons with respiratory infections;
- Use measures to avoid gastroesophageal reflux disease (GERD) (Kim et al., 2013);
- Trial methods of smoking cessation if patient still smokes and avoid second-hand smoke;
- Avoid the outdoors during increased levels of environmental pollutants (Mackay & Hurst, 2012);
- Teach patients to recognize an exacerbation early and when to contact their healthcare provider;
- Yearly influenza vaccination, ideally by October (CDC, 2013a); and
- Pneumonia vaccine at least once with a single booster 5 years later if the person was younger than 65 years old when the initial vaccine was given (CDC, 2013a).

Case Study Conclusion

It was found that Mr. B was having difficulty using his MDI because of his arthritis. A decision was made to change his MDIs to a nebulizer, which was easier to use. In addition, he was given supplemental oxygen and a short course of prednisone and antibiotics. During his acute exacerbation, he used a liquid dietary supplement, "boost" for additional calories and protein in between small, frequent meals, which were easier to manage with his shortness of breath. When his symptoms improved, he was enrolled in a 12-week pulmonary rehabilitation program to improve his exercise tolerance. In a recent meta-analysis, pulmonary rehabilitation was found to have both short-term and long-term positive effects on exacerbation rates (Garvey et al., 2010; Ochman et al., 2012).

Palliative Care Considerations for COPD

Palliative care aims to relieve suffering at all stages of disease and is not limited to end-of-life care. Evidence increasingly supports use of short-acting opiates for relief of breathlessness in selected patients (Boland et al., 2013). Consider using the COPD assessment test questionnaire to measure the health status of patients with COPD. This reliable short 8-item questionnaire was developed for use in routine clinical practice and measures the impact of COPD on a person's life and how this changes over time (Lari et al., 2014). This can be found at http://www.catestonline.org.

Pneumonia and Influenza

Community-acquired pneumonia (CAP) is defined as an acute infection of the lung in a person who acquired the infection in the community. It is a common and potentially serious disease, and the economic burden of CAP will continue to increase as the current population ages. Risk for CAP (Box 2) increases during the winter months, and is more likely in those with comorbidities such as diabetes, congestive heart disease, and COPD (Murphy et al., 2012). The most common

Box 2. Predisposing Risk Factors for Community-Acquired Pneumonia

- Alteration in consciousness or dysphagia
- History of stroke or seizure
- Overuse of antipsychotic drugs
- Smoking tobacco
- Alcohol abuse
- History of chronic obstructive pulmonary disease or other respiratory illness
- Malnutrition
- Age greater than 65 years
- Influenza
- Previous history of pneumonia
- Administration of immunosuppressant drugs
- Chronic illness such as kidney disease, sickle cell anemia, or diabetes
- Lack of vaccination
- Poor dentation or oral hygiene

cause in the United States is the bacterium *Streptococcus pneumoniae*; however, viruses are responsible in 20% of adult CAP cases. Most persons are treated at home with oral antibiotics, and should improve after 3 to 5 days of antibiotic treatment, although residual cough may last up to 1 month.

The influenza virus impacts the ability to cough up mucus for up to 12 weeks postinfection. Usual breakouts occur from October to March in the northern hemisphere. Both A and B types cause acute respiratory illness, especially pneumonia. According to the CDC, in 2012 66.5% of adults over age 65 years had received the influenza vaccine. However, in adults age 50 to 64, only 42.7% received it in 2011 and 2012 (CDC, 2013a).

Case Study

Mrs. A is a 76-year-old woman with mild dementia and Type 2 diabetes, who requires assistance with all activities of daily living (ADL) at home. She is noted to have a dry cough for 3 days, increased fatigue, and a respiratory rate of 30 breaths per minute, which are shallow at rest. She states she has not had much to eat the last couple of days because she was too weak. Her lung sounds have diffuse crackles and expiratory wheezing with dullness to the left lower lobe on percussion. Her heart rate is regular and 110/minute. She does not have a fever. She was hospitalized 6 months ago for confusion and urinary tract infection. Her current medications include:

- Metformin 500 mg twice per day with meals, and
- Seroquel 50 mg daily.

Discussion

Aspiration is the most common route of infection and subsequent pneumonia in the elderly because of aging host defenses accompanied by chronic illness, inability to walk without assistance, urinary incontinence, and inability to perform own ADL. Pneumonia should be suspected when the respiratory rate is greater than 28, especially with elevated heart rate. Fever may or may not be present. In addition, confusion may be the only presenting symptom suggesting pneumonia (Wunderink & Waterer, 2014). Indications for hospitalization are based not only on severity of illness, but an ability to maintain oral intake, likelihood for medication compliance, level of cognitive impairment, living situation, and functional status. The simplified CURB-65 score was developed to assist with making the decision to go to the ED and has been found reliable (Myint et al., 2007). Each variable is worth 1 point; a score of 2 indicates evaluation in the ED for possible hospital admission.

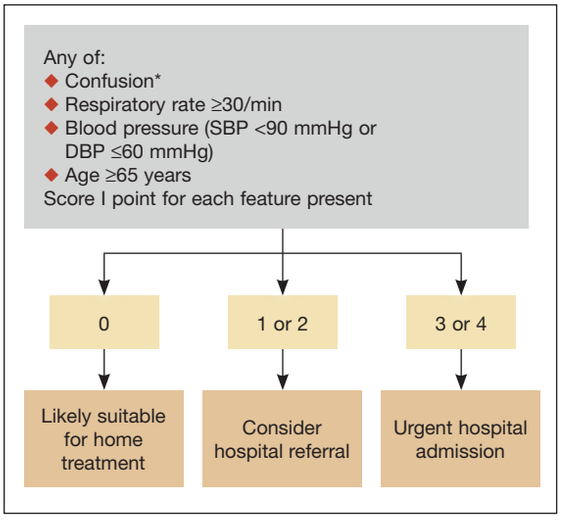

Figure 1. Severity assessment used to determine the management of CAP in patients in the community (CRB-65 SCORE). Reproduced from *Thorax,* Lim, W. S., Baudouin, S. V., George, R. C., Hill, A. T., Jamieson, C., Le Jeune, I., Macfarlane, J. T., Read, R. C., Roberts, H. J., Levy, M. L., Wani, M., Woodhead, M. A., 46(S3), iii1-iii55, Copyright © 2009 BMJ Publishing Group Ltd. With permission from BMJ Publishing Group Ltd.

Note. DBP = diastolic blood pressure; SBP = systolic blood pressure.

Self-Care Strategies for Prevention of Pneumonia

- Smoking cessation,
- Pneumonia vaccination,
- Yearly influenza vaccination, and
- Infection control—including frequent hand washing and limiting exposure to others who are sick.

Case Study Conclusion

Using the CURB-65 criteria (Figure 1), Mrs. A has a score of 2. She has respirations greater than 30 (1 point), and is older than 65 years (1 point). In addition, she is unable to maintain her

Pneumonia should be suspected when the respiratory rate is greater than 28, especially with elevated heart rate.

oral intake and medications. Unfortunately, she will need to go to the ED. This may have been avoided if her pneumonia vaccine had been updated. In addition, careful monitoring of the elderly on antipsychotic medications is essential. Use of antipsychotics is associated with an almost 60% increase in the risk of pneumonia (Knol et al., 2008).

HF

HF is a clinical syndrome characterized by the heart's inability to adequately eject blood (HF with reduced ejection fraction) or fill with blood (HF with preserved ejection fraction) (Carroll, 2012). It can result from any structural or functional cardiac disorder that interferes with systolic or diastolic function. The inability of the heart to pump adequately may result in pulmonary and systemic venous congestion and inadequate peripheral oxygen delivery at rest or during increased activity and stress. This dysfunction leads to symptoms such as fluid retention, weight gain, edema, shortness of breath, fatigue on exertion, orthopnea, bendopnea, and paroxysmal nocturnal dyspnea (Abraham & Hasan, 2011). Symptoms may not appear for years depending on the area of the heart affected and the severity of dysfunction.

Box 3. Risk Factors for Developing Heart Failure (HF)

- Hypertension—75% of HF cases have antecedent hypertension (Lloyd-Jones et al., 2010)
- Cigarette smoking
- Obesity
- Substance abuse
- Coronary artery disease
- Ischemic heart disease
- Myocardial infarction
- Valvular heart disease, especially aortic stenosis
- Diabetes mellitus
- Connective tissue disorders
- Myocarditis

Box 4. American College of Cardiology/ American Heart Association Four-Stage Classification System

- Stage A: High risk for developing HF, but no structural heart disease
- Stage B: Structural damage to the heart, but no symptoms
- Stage C: Past or current HF symptoms and evidence of structural heart damage
- Stage D: End-stage disease, requiring special interventions

Note. HF = heart failure.

Box 5. New York Heart Association Functional Classification System

Class I: No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or angina.
Class II: Slight limitation of physical activity. Ordinary physical activity results in fatigue, palpitation, dyspnea, or angina.
Class III: Marked limitation of physical activity. Comfortable at rest, but less than ordinary physical activity results in fatigue, palpitation, dyspnea, or angina.
Class IV: Unable to carry on any physical activity without discomfort. Symptoms are present at rest. With any physical activity, symptoms increase.

HF is the fastest growing heart condition in the United States and is associated with a high risk of disability and death. According to the American Heart Association's Report on Heart Disease and Stroke Statistics Update (2013), 5.1 million people currently have HF (Go et al., 2013). It is the most frequent cause of hospitalization in adults, age 65 and older, with an estimated more than 1 million hospitalizations occurring each year (Go et al., 2013). Twenty-five percent of patients hospitalized with HF are readmitted within 30 days of discharge (CDC, 2013b). Currently the estimated cost of HF is $32 billion a year and it is projected that this cost will increase to $70 billion by 2030 (Go et al., 2013). Strategies to reduce hospitalizations include treatment of the causes of HF, guideline-directed medical therapy, device therapy, effective treatment of comorbidities, and measures to increase patient's consistent self-care (Riegel et al., 2009).

Early identification and treatment of risk factors for cardiovascular disease is the most important intervention in decreasing the public health

Indications for hospitalization are based not only on severity of illness, but an ability to maintain oral intake, likelihood for medication compliance, level of cognitive impairment, living situation and functional status.

impact of HF (Box 3, Go et al., 2013). Once an HF diagnosis is made, patients can be stabilized and myocardial function can improve with current advances in therapy. The American College of Cardiology and the American Heart Association established a four-stage classification system (Box 4) to be used in conjunction with the New York Heart Association (NYHA) functional classification (Box 5) to guide treatment (Carroll, 2012).

Case Study

Mrs. V is a 76-year-old woman with combined nonischemic systolic (left ventricular ejection fraction is <20%) and diastolic HF. She lives alone in a single-story home and has no extended family. Her comorbidities include mild COPD, Type 2 diabetes, mild chronic renal disease, atrial fibrillation, nonobstructive coronary artery disease, and hyperlipidemia. She reports that she does not adhere to her medication regimen because frequent urination that interferes with her daily activities and high drug costs. She denies orthopnea but has "mild" shortness of breath with exertion and paroxysmal nocturnal dyspnea, which causes her anxiety. Currently she has trace pitting ankle edema and her baseline weight is 114 lbs. Her NYHA functional classification is currently 2 (slight limitation of physical activity; ordinary physical activity results in fatigue, palpitation, dyspnea, or angina) and her American College of Cardiology/American Heart Association Stage of HF is C (current symptoms and evidence of structural heart damage). She has an implantable cardiac defibrillator.

Her multidrug regimen includes:

- Carvedilol 12.5 mg by mouth twice daily,
- Valsartan 80 mg by mouth twice daily,
- Isosorbide mononitrate 30 mg daily,
- Metformin 250 mg by mouth once daily with largest meal,
- Dabigatran etexilate 15 mg daily,
- Simvastatin 10 mg by mouth once daily,
- Furosemide 40 mg by mouth twice daily,
- Aspirin 81 mg by mouth once daily,
- Tiotropium 18 mcg inhalation once daily,
- Formoterol 12 mcg inhalation twice daily, and
- Albuterol MDI up to four times daily as needed.

Discussion

Goals of therapy include improving symptoms and quality of life, increasing functional capacity, slowing disease progression, decreasing the need for hospitalization, and prolonging survival. Monitoring of daily weight is crucial to avoid serious complications and hospitalizations (Riegal et al., 2013). Patients should weigh themselves on rising, after they have urinated, but before eating breakfast or dressing. A change of 1 lb overnight or 3 to 5 lbs in a week should be reported to her healthcare provider for further evaluation and change in therapy. Engagement in self-care strategies such as daily monitoring of weight is thought to reduce the need for ED visits and hospitalizations (Riegel et al., 2013). Patients with HF are typically older adults with multiple significant comorbidities, which result in complex drug regimens and increased costs (Ahmed, 2009).

Self-Care Strategies for Prevention of HF Exacerbation

- Take medications as prescribed: use of 7-day medication planner is helpful;
- Monitor weight daily;
- Manage sodium intake: limit sodium intake to 2,000 mg per day and know how to read labels to identify sodium in processed, packaged foods;
- Eat a heart-healthy diet: monitor and manage cholesterol;
- Smoking cessation;
- Avoid alcohol intake: no more than 2 to 3 alcoholic drinks per week;

- Be physically active: obtain a prescription for type, intensity, and duration according to HF functional class and severity;
- Monitor and manage blood pressure; and
- Manage depression and emotional stress and social connection.

Case Study Conclusion

In addition to her medication regimen and sodium-restricted diet, she received education and counseling to improve consistent engagement in self-care. This included information to help her recognize and monitor her HF symptoms (including daily weights), and symptom management. She was provided a tool outlining appropriate actions should her symptoms change and a scale for diuretic dosing according to her early morning weight. A comprehensive care plan was established by her multidisciplinary team with her input and was communicated to the team members. Her daily diuretic dose was scheduled for early afternoon so her morning ADL would not be interrupted by frequent urination. Price comparisons were performed on her prescribed medications to maximize insurance coverage and reduce her pharmaceutical costs. She was given contact information for her team members and encouraged to call with questions or concerns regarding her plan of care or a change in her symptoms.

Regular physical activity was recommended as a safe and effective way for her to improve functional status (Yancy et al., 2013). Illustrated exercises were provided as a safe way to increase activity at home and participation in a local cardiopulmonary rehabilitation program following occupational therapy consultation was offered. Her anxiety eased as she became more knowledgeable in monitoring and managing her HF symptoms. Enrollment in telephonic monitoring of daily weights, blood pressure, and pulse oximetry readings allowed her healthcare team to continue to monitor her closely and efficiently in the home setting. Prompt attention to changes in symptoms, such as weight, prevented progression of decompensated HF and subsequent hospital readmission.

Palliative Care Considerations for HF

HF is a progressive disease with no cure and can lead to disability and death. Fifty percent of patients diagnosed with HF will die within 5 years in spite of improvements in treatment (Yancy et al., 2013). About 5% of patients have end-stage disease (stage D HF) that is refractory to medical therapy (Go et al., 2013). Ideally, palliative care should be initiated when patients are diagnosed with HF as it provides support to the patient and their families (Adler et al., 2009). Palliative care improves outcomes, including patient and family satisfaction with care and symptom management (Adler et al., 2009). The 2005 American College of Cardiology and American Heart Association guidelines for treatment of HF include recommendations for ongoing discussion with patients and families about the prognosis for functional capacity and survival (Yancy et al., 2013). An important component of care is shared decision making among the patient, caregivers/family, and the healthcare team (Yancy et al., 2013). Communication should include discussions regarding advance directives, appointment of a healthcare proxy decision maker, establishment of the circumstances under which the patient would prefer comfort measures to life-prolonging measures, as well as other end-of-life preferences.

Of all the advanced disease states, HF has one of the greatest effects on patients' quality of life (Adler et al., 2009). These patients suffer from fatigue and dyspnea, as well as pain, depression, edema, insomnia, anxiety, confusion, anorexia, and constipation (Yancy et al., 2013). The goals of palliative care are to relieve suffering with a multidisciplinary, holistic approach to addressing patients' and caregivers' physical, emotional, spiritual, and logistical needs. The prognosis of HF is variable and uncertain. It may be measured in months or years. This uncertainty is a barrier to timely referrals to hospice care. As the provision of care progresses away from life-prolonging treatment toward emphasis on relief of suffering, hospice care should be considered (Yancy et al., 2013). During end-stage HF, life-prolonging care is discontinued according to patient's wishes or when the harm of treatment outweighs its benefit. After death, palliative care services continue and assist family members with bereavement (Adler et al., 2009).

In conclusion, COPD, pneumonia, and HF are conditions commonly cared for in the home setting with the goal of avoiding the ED whenever possible. Engagement of self-care strategies described in this article empowers both

patients and healthcare providers to impact the frequency of exacerbation in these chronic illnesses. ⌂

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