Hospital Discharge Education for Patients With Heart Failure: What Really Works and What Is the Evidence?

Sara Paul, RN, MSN, FNP

Despite advances in therapy, morbidity and mortality remain high in patients hospitalized for heart failure. Although new approaches to improving the use of guideline-recommended evidence-based therapies at hospital discharge are undeniably needed, truly comprehensive and competent care for patients hospitalized with heart failure requires a strong focus on education of patients and their families.

Education at discharge is a vital component of improving outcomes in heart failure. The institution of a structured system of patient and family education that involves a multidisciplinary team and emphasizes medication adherence, sodium and fluid restrictions, and recognition of signs and symptoms that indicate progression of disease may be as important as ensuring that patients are prescribed appropriate medical therapy. Specific topics of instruction for patients hospitalized with heart failure are listed in Table 1. Poor adherence to these instructions can lead to worsening of disease and rehospitalization. According to estimates, 54% of readmissions may be preventable, and inadequate discharge planning and education or lack of patient follow-up are common factors in readmission. Lack of compliance with medications, failure to follow a salt-restricted diet, and delays in seeking medical attention are among the primary reasons for the high rate of rehospitalization among patients with heart failure.

Patients who are not knowledgeable about their disease and their medication are at a severe disadvantage. In one study, the association of medication adherence and knowledge was tested in 61 patients age 50 years or older who had heart failure. Patients' knowledge of the dosage, frequency, and indication of each of their heart failure medications and patients' ability to open medication bottles, read labels, and distinguish tablet/capsule colors were assessed. Lower medication adherence ($P = .001$) and an inability to read labels ($P = .002$) were significantly associated with an increased number of cardiovascular-related visits to the emergency department. Patients with greater medication adherence had a mean...
Visits to the emergency department per patient compared with patients who were less adherent, who had 1.00 (2.47) visits per patient. Overall, greater knowledge of, skills with, and adherence to medication were associated with fewer visits.

Education of patients at discharge promotes self-care, reduces readmissions, and helps patients identify problems early, increasing the chances for intervention and improved outcomes. In this article, I discuss the importance of educating patients and their families in preventing rehospitalization for heart failure. I also address the use of performance measures to improve patients’ outcomes and methods for promoting retention of discharge instructions.

Performance Measures Related to Discharge

Education for Patients With Heart Failure

Performance measures are criteria used by organizations to determine whether an organization is fulfilling its vision and meeting its patient-focused goals. These measures are standardized to evaluate hospitals and health care systems, regardless of location, in order to promote positive outcomes in patient care. Performance measures may reflect medical management of patients, but they may also assess aspects of patient care, such as education of patients and their families at discharge. The latest guidelines for management of heart failure from the Heart Failure Society of America recognize the importance of education and recommend that patients receive educational materials as part of the patients’ complete discharge instructions. These materials should address recommended activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if signs or symptoms worsen.

The American College of Cardiology/American Heart Association (ACC/AHA) Clinical Performance Measures for Adults With Chronic Heart Failure include the following inpatient performance measures for patients with heart failure: discharge instructions, evaluation of left ventricular systolic function, angiotensin-converting enzyme inhibitor or angiotensin-receptor blocker for left ventricular systolic dysfunction, adult smoking cessation advice/counseling, and anticoagulant at discharge for patients with atrial fibrillation. The guidelines recommend that the clinical care team collect data and review compliance with these measures on a routine basis, look for changes, and adjust practice patterns as necessary to improve performance. The performance measure of discharge instructions and its components are shown in Figure 1.

The Joint Commission evaluates 4 performance measures for patients with heart failure that are similar to those of the ACC/AHA: discharge instructions (HF-1), assessment of left ventricular function (HF-2), use of angiotensin-converting enzyme inhibitors in patients with left ventricular systolic dysfunction (HF-3), and smoking cessation counseling (HF-4). These Joint Commission core measures require that patients

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**Table 1** Lifestyle changes required in the self-management of heart failure

<table>
<thead>
<tr>
<th>Lifestyle Change</th>
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<tbody>
<tr>
<td>Adopt a low-sodium diet (&lt;3000 mg for NYHA functional class I and II; &lt;2000 mg for NYHA functional class III and IV)</td>
</tr>
<tr>
<td>Restrict fluid intake to 2 L (approximately 8 cups) per day if indicated</td>
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<tr>
<td>Stop smoking</td>
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<td>Increase activity/exercise at a low to moderate intensity</td>
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<tr>
<td>Monitor weight daily</td>
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<tr>
<td>Notify health care provider of signs and symptoms of worsening heart failure, such as weight gain of more than 3 lb (1.3 kg) in a week or 2 lb (0.9 kg) overnight</td>
</tr>
<tr>
<td>Eliminate alcohol consumption</td>
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<tr>
<td>Reduce fat and cholesterol in diet if coronary artery disease is present</td>
</tr>
<tr>
<td>Learn all signs and symptoms to report to health care provider: pain in jaw, neck, or chest; increased shortness of breath or fatigue; dizziness or syncope; swelling in feet, ankles, legs, or abdomen; palpitations; and racing heart (&gt;120 beats per minute)</td>
</tr>
</tbody>
</table>

Abbreviation: NYHA, New York Heart Association.  
* Based on data from Albert and Paul.

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4. Discharge Instructions

Heart failure patients discharged home with written instructions or educational material given to the patient or caregiver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.

Numerator

Heart failure patients with documentation that they or their caregivers were given written discharge instructions or other educational material addressing all of the following:
1. Activity level
2. Diet
3. Discharge medications
4. Follow-up appointment
5. Weight monitoring
6. What to do if symptoms worsen

Denominator

Heart failure patients discharged home.

Included populations:
- Discharges with an ICD-9-CM Principal Diagnosis Code for heart failure as defined in table 3
- A discharge to home or home care

Excluded populations:
- Patients less than 18 years of age

Period of assessment

Hospital discharge

Sources of data

Administrative data and medical records

Rationale

Education of heart failure patients and their families is critical. Failure of these patients to comply with physician's and other health care providers' instruction is sometimes a cause of HF exacerbation. A significant cause of patient's failure to comply is lack of understanding. It is, therefore, incumbent on health care professionals to be certain that patients and their families have an understanding of the causes of heart failure, prognosis, therapy, dietary restrictions, activity, importance of compliance, and the signs and symptoms of recurrent heart failure. Thorough discharge planning is associated with improved patient outcomes (11).

Reference Recommendation(s)

CMS/JCAHO Core Measure: Heart Failure, HF-1: Discharge Instructions (9).

Method of Reporting

Aggregate rate (standard error) generated from count data reported as a proportion.

Figure 1

American College of Cardiology/American Heart Association performance measure: discharge instructions.

Abbreviations: CMS, Centers for Medicare and Medicaid Services; HF, heart failure; ICD-9-CM, International Classification of Disease, Ninth Revision, Clinical Modification; JCAHO, Joint Commission.

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were not documented. More recently, data from 81,142 admissions of patients with heart failure in the Acute Decompensated Heart Failure National Registry (ADHERE) were analyzed to determine rates of conformity with the 4 core performance measures from the Joint Commission.13 The median rate of conformity with discharge instructions (HF-1) was only 24% (range, 0%-99%), and the median rate of conformity with HF-4 (counseling for smoking cessation) was 43.2% (range, 0%-100%). A substantial gap in overall performance is apparent among hospitals. The establishment of educational initiatives and quality improvement systems to reduce this variability may substantially improve care.

Does Compliance With Performance Measures Improve Clinical Outcomes?

The relationship between current ACC/AHA performance measures for patients hospitalized with heart failure and clinical outcomes was investigated in the Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients With Heart Failure (OPTIMIZE-HF), a registry and performance improvement program for patients hospitalized with heart failure. Only use of an angiotensin-converting enzyme inhibitor or an angiotensin-receptor blocker at discharge was associated with a reduction in mortality or rehospitalization at 60 to 90 days after discharge.14 Trials comparing conventional management of heart failure with management programs that included counseling of patients about diet, exercise, medications, and monitoring have shown that disease management programs can reduce hospital stays and improve functional status.15 However, these programs often involve outpatient programs, such as clinics or home visits, that are beyond those normally assessed in the ACC/AHA performance measure on discharge instructions. It is unclear whether the discharge instruction performance measure as recorded in the hospital reflects whether the patients did or did not receive each defined component of education. Patient education may be documented in the medical record even if the education was cursory and allowed little time for the patient to absorb and retain the information.15 Conversely, many patients and their families are not ready to learn at the time of diagnosis, regardless of how thorough the instructional session may be. Extensive education may be better absorbed when a patient is in a stable condition and has adapted to living with heart failure.16

In the analysis of data from OPTIMIZE-HF, the discharge instruction performance measure did not have an effect on mortality or rehospitalization at 60- to 90-day follow-up.14 Fonarow et al14 concluded that current performance measures related to heart failure, other than the prescription of an angiotensin-converting enzyme inhibitor or an angiotensin-receptor blocker at discharge, have little effect on patients’ outcomes shortly after discharge. Another OPTIMIZE-HF analysis17 specifically addressed education of patients; researchers assessed the characteristics of patients who did and did not receive the full set of components from the Joint Commission process-of-care performance measure (HF-1) and then analyzed whether receipt of this measure was predictive of other elements of discharge planning. Credit for the core measure (HF-1) was not given unless all 6 components (activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if signs or symptoms worsen) were documented. Despite recommendations that complete instructions be given to patients with heart failure before hospital discharge, both the process intervention tools to facilitate HF-1 and HF-1 itself were underused. Delivery of the full set of HF-1 components was significantly more likely in the 46% of patients who received process improvement tools.17 Additional measures and/or better methods for identifying and validating performance measures related to heart failure may be needed to improve care and outcomes of patients with heart failure.14

Data suggest that in practice, discharge education is not emphasized as an essential component of optimal care for patients with heart failure. A retrospective review18 of medical records at a large, inner-city teaching hospital of 104 patients with heart failure showed that discharge counseling about medication adherence, restricted sodium intake, and the importance of weight monitoring was provided to only 50%, 48%, and 9% of patients, respectively. The large number of patients who are discharged without receiving education may represent important missed opportunities to decrease morbidity and mortality.

Educational Tools and a Multidisciplinary Team

Critical pathways and in-hospital instructional tools may improve the
discharge instructions, and the standardized forms, computer and nurse practitioner who used a dedicated heart failure physician improved only after the appointment of a heart failure program. The scores for core measures did not lead to improvement in quality of care. This was not enough to guarantee evidence-based medicine. A key component is the Patient Management Tool, a Web-based interactive assessment and reporting system that tracks treatment and facilitates evidence-based medicine. This tool helps caregivers manage patients’ care by providing (1) drop-down reminders of current guidelines at key data points, (2) prescriptive medication reminders specific to the patient’s disease, (3) printed disease-specific patient education materials before discharge, and (4) automated patient dismissal notes and referring physician letters. An example of the discharge instructions is shown in Figure 2. This tool includes education as part of the overall discharge checklist.

Although many hospitals are adapting the tools from the Get With the Guidelines heart failure program into care, the presence of tools alone is not enough to guarantee evidence-based practices. In a study of how core measures from the Joint Commission are applied at a university hospital, availability of standardized order forms, computer discharge instructions, and education materials did not lead to improvement in scores for core measures. The scores improved only after the appointment of a dedicated heart failure physician and nurse practitioner who used the standardized forms, computer discharge instructions, and the education materials. Use of the dedicated heart failure team led to quick and sustained improvements.

In addition to verbal information, a combination of educational materials may enhance a patient’s ability to absorb information. Books, newsletters, videos, CDs, Web pages, and computer-based programs augment the learning process and offer further opportunities for education at patients’ convenience after discharge from the hospital. Many patients will need repeated education through follow-up telephone calls, newsletters, educational bulletins, or support groups because of the volume of information that is given at the time of hospital discharge.

Educational tools must be a component of multidisciplinary care provided to heart failure patients. The team approach to education of patients improves patients’ outcomes. In one study, an intervention group (n = 44) of patients received education from a cardiac nurse educator, a registered dietitian, and a physical therapist, along with corresponding written materials. These patients received an initial visit, as well as a follow-up visit from the nurse educator, dietitian, and physical therapist during the patients’ hospitalization. Discharge planning was coordinated with home health nurses, who reinforced the instructions given in the hospital. Patients in the control group who received “usual care” did not have access to the nurse educator, did not automatically receive dietary and physical therapy consultations, did not have routine telephone contact after discharge, and did not receive home visits from nurses trained in management of heart failure. Hospital readmission rates were 4 times higher in the group of patients who received usual care (n = 77) than in patients in the intervention group. Additionally, patients in the control group required nearly 50% more skilled nursing care visits and more than twice as many home health aid visits than did the patients in the intervention group. The 6-week cost savings for the intervention group was $67,804.

Barriers to Learning

Successful management of heart failure often requires major lifestyle adjustments, such as modifications in diet and activities, compliance with a complex medication regimen, and the need to assess and monitor signs and symptoms. Despite best efforts at education, helping patients understand all of the complexities of their disease and therapy may be difficult. Many patients have low levels of knowledge of their disease and lack a clear understanding of heart failure and self-care. In a study of knowledge level in patients with heart failure, although two-thirds of the patients reported receiving information or advice about self-care from health care providers, 37% of patients knew “a little or nothing,” 49% knew “some,” and only 14% knew “a lot” about heart failure. Approximately 40% of the patients did not recognize the importance of weighing themselves daily, and 25% did not appreciate the risk of consuming alcohol. Although 80% of the patients knew they should limit the amount of salt in their diet, only one-third regularly avoided salty foods.

Understanding patients’ barriers to learning may enable nurses to tailor educational approaches accordingly. Simply communicating a...
**CARDIOVASCULAR DISEASE DISCHARGE INSTRUCTIONS**

<table>
<thead>
<tr>
<th>Discharge Medications</th>
<th>Dosage</th>
<th>Frequency</th>
<th>Start Date/Time</th>
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<tbody>
<tr>
<td>Nitroglycerin</td>
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<td>Spironolactone</td>
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</table>

- Pain

**Exercise/Activity/Diet/Prescription Information Given:** *See back for health education and resources*

If you smoke, STOP! *(Smoking will make heart disease worse and may cause death.)*

- ☐ Booklet Given, see back
- ☐ Does not smoke - or - Has not smoked in more than 12 months
- ☐ AMI/CHF Discharge Packet Given
- ☐ Home Exercise Program Instruction Provided
- ☐ Drug info/food/drug interaction info provided
- ☐ Cardiac Rehab Information Provided
- ☐ Daily Weights Instructions Given-See back
- ☐ Cardiac Rehab Ordered
  - Yes
  - No
- ☐ Diet __ Low Sodium, Low Cholesterol, high fiber
  - Your Total Cholesterol: ___
- ☐ Resources on back reviewed
- ☐ Driving Instructions Given

**May Return to Work on (date) _________________**

- ☐ Activity: Light activity until follow-up appointment

**Follow-Up appointment:**

<table>
<thead>
<tr>
<th>Dr.:</th>
<th>Phone:</th>
<th>Date:</th>
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**Home Care Agency:**

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<th>Date:</th>
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- MD/RN Signature _______________________________________________________________________
  - Date ______________

- Choices Provided on ______________________________ :CM Signature ___________________________  - Date __________

I have received a copy of this form and understand the instructions. Patient signature ______________________________________

**NOTE:** Any old, unused pills or liquid at home should be flushed down the toilet. Please discuss with your doctor any medications (including over the counter pills or liquid not ordered by the doctor) you have been taking at home if they are not listed above.

**KEEP THIS FORM AND BRING IT WITH YOU TO ALL FOLLOW-UP DOCTOR APPOINTMENTS**

**Figure 2** The American Heart Association Get With the Guidelines heart failure discharge tool.¹⁹

Abbreviations: ACE-I, angiotensin-converting enzyme inhibitor; AMI, acute myocardial infarction; ARB, angiotensin-receptor blocker; CHF, congestive heart failure; CM, case manager; info, information; MD, physician; rehab, rehabilitation; RN, registered nurse.
therapeutic plan is different from successfully educating patients and their families. Patients and their families should be treated as partners in learning, not as pupils. If patients feel engaged in the discussion and their learning needs are assessed, they may feel that the information is more pertinent to their situation. Teaching sessions should not be a 1-way communication session, but should engage patients in identifying their learning needs. Nurses who teach patients should receive training to ensure that the educational information taught is consistent among all staff members. If the information varies among the staff, patients and their families can become confused.

Hospitalized patients may be anxious about their disease and may be concerned about their ability to perform self-care once they are home. Plenty of time should be allowed for patients to ask questions as they digest the new information. Paper and pencil should be available at the bedside for patients to write down questions as they think of them. Patients and family members should be given a telephone number that they may call to speak to a nurse if they have any questions or problems after discharge. Knowing that they will receive follow-up home visits or telephone calls may allay their anxiety and fears and allow patients to absorb information more readily.

An articulate and fluent translator should be included in teaching sessions when patients do not have command of the English language. The translator should be available if a patient has questions later. Cultural differences may impede the learning process. Dietary preferences may be somewhat different for patients of different cultures, and flexibility should be given to allow patients to maintain their cultural differences yet remain within healthy parameters. If possible, a dietitian should be involved to help patients select foods that are acceptable to the patients’ palate but low in sodium. Foods such as soy sauce or tomato salsa are high in sodium, and every effort should be made to find low-sodium substitutes.

Educational interventions should be specifically tailored for patients and their families and should target their particular barriers to learning, such as functional and cognitive limitations, misconceptions, low motivation, and low self-esteem. The reasons for difficulty in following a prescribed regimen are multifactorial, but possible barriers to self-care and optimal adherence may include a complex medication regimen that is confusing to the patient, cognitive impairment that makes it difficult for the patient to remember instructions, or the lack of motivation to follow discharge instructions.

Complex Medication Regimen

Patients with heart failure are often discharged with complex medication regimens. Despite the best intentions of practitioners, patients’ understanding of the reason for each medication may be low, and their ability to follow therapeutic instructions may be limited. Noncompliance can be as high as 64% for medication and 22% for diet. In a retrospective study of 1031 admissions for heart failure, noncompliance with medications and diet led to sodium retention and was the causative factor in 55% of the admissions. One-third of the patients were noncompliant with medications, diet, or both. In a study of 220 patients with multiple hospital admissions, the rates of noncompliance with medication, smoking cessation, and abstaining from alcohol were as high as 64%, 69.5%, and 71%, respectively. Compliance may be increased by improving patients’ understanding of the importance of the therapy and by streamlining therapy through the use of once-daily agents to reduce the complexity of pill-taking regimens.

Cognitive Impairment

A patient’s ability to understand, remember, and apply what he or she was taught at discharge is another large barrier. Elderly patients often have comorbid conditions in addition to heart failure that can make it difficult to understand and comply with therapy. The incidence of cognitive impairment among patients more than 65 years old who have heart failure is high compared with the incidence in younger patients, indicating that education of elderly persons is a challenge. Cognitive impairment may include short- or long-term memory loss, dementia, or attention deficit. In a study of recall of recommendations and adherence to advice among patients with heart disease, Kravitz et al found that patients who did not recall the instructions had a much greater risk of noncompliance with medications and diet than did patients who remembered the instructions. Interestingly, patients whose physicians counseled them about lifestyle changes and medications were significantly (P<.05) more likely to recall the recommendations during
a follow-up telephone interview. Unfortunately, even among patients who recalled the advice, the non-compliance rate with smoking cessation remained high.

Cline et al.33 examined the extent of noncompliance with prescribed medication in elderly patients with heart failure and reviewed the extent to which patients recalled information given about it. All patients received standardized verbal and written information about their medication, but only 12 (55%) could correctly name what medication had been prescribed, 11 (50%) were unable to report the doses prescribed, and 14 (64%) could not remember what time(s) the medication was to be taken.

To overcome memory issues, we must ensure that all instructions and advice verbally communicated to patients are also provided in a written format that patients can take with them to share with family members and refer to later. Family members should be included in the educational session so that they hear the information and can reinforce the instructions once the patient is at home. If the patient’s friend or family member who assists in preparing the weekly medications cannot attend a teaching session or an appointment when medication changes are discussed, a note explaining the changes should be sent home with the patient. Even better, a telephone call to the person who oversees the patient’s medications will prevent confusion or medication errors. If a patient with cognitive impairment does not have a family member to assist with medications, it may be helpful to contact the patient’s local pharmacist, home health nurse, or physical therapist to clarify changes in medication. Any health care professional who has regular contact with a patient can help in evaluating whether the patient is taking the medications correctly.

A list of medications and when to take them should be in large print, and patients should be instructed to place that list prominently in the area where daily medications are stored. Weekly pill containers with 3 compartments per day for morning, afternoon, and night doses help patients remember if they have taken their medications earlier in the day. Refrigerator magnets with information about signs and symptoms of worsening heart failure and the telephone number that the patient should call if those symptoms occur can serve as easily accessible daily reminders. Pictures of foods to avoid, such as high-sodium foods, should be available for patients to keep near the patients’ grocery shopping list. Follow-up telephone calls or home visits may help patients remember and follow important discharge instructions. Charts that specify the time of day for each medication dose, either with the use of a clock depicting the time or with doses scheduled around meals, may enhance patients’ ability to take pills at the correct time of day (Figure 3). Pictures of each pill, which can be found in many medication books or online, can help patients identify their medications and may reduce medication errors.

Lack of Motivation

Patients’ difficulty in following recommendations for diet, exercise, and smoking cessation may be due to lack of motivation and/or self-control. An increase in knowledge is not necessarily accompanied by concomitant changes in compliance behaviors. Poor physical capacity, fatigue, and depression and anxiety are common among patients with heart failure,25 and all these factors can lead to lack of motivation and low interest in learning how to perform self-care. Ni et al.24 reported that although most elderly patients with heart failure confirmed the importance of restricting sodium intake and limiting fluid consumption, less than half reported always avoiding salty food, and an equally low percentage did not closely monitor daily weight or fluid intake. This type of noncompliance indicates the need for education about the importance of dietary restrictions and potential consequences of nonadherence. Effective communication between patients, their families, and the health care team may help minimize the difficulties associated with dietary restrictions.

Health care providers may think that a broad statement such as “remove salt from your diet” or “weigh yourself every day” is sufficient education. But important aspects of communication are left out of instructions like these, such as why the change is important, specific details, and examples of how to go about these lifestyle changes.2 The poor taste of low-sodium food may also be a large barrier.34 Eliciting the assistance of a clinical dietician for strategies that help patients and caregivers find special food items, plan menus, adjust recipes, and alter the preparation of food can be of great benefit.2,31 Helping a patient plan meals and prepare a grocery list with appropriate low-sodium foods will offer “real-life” ideas and
suggestions. Cookbooks and Web sites with low-sodium recipes can be helpful to patients and their spouses as they plan meals (Table 2). Lists of foods to avoid, foods to enjoy in moderation, and foods that are within dietary guidelines should be readily available for patients, along with lists of substitutes or alternatives to high-sodium foods.

Although smoking can contribute to increased risk for multiple hospital admissions, most patients lack motivation to stop smoking cigarettes.29 Despite medical counseling and awareness that smoking induces signs and symptoms of heart failure, patients who have been hospitalized often continue to smoke. Although smokers may be instructed to quit, they may not be provided with the proper counseling or referral to a program or technique that would assist them.30 Education and counseling sessions to promote behavior change, referral to smoking cessation programs, and recommendations to use nicotine replacement substances may be key to helping patients with nicotine addiction. Medications that promote smoking cessation, such as bupropion or varenicline, should be used with extreme caution, and patients should be closely monitored during therapy.

Similar techniques should be used in patients who are at risk for continuing to consume alcohol after discharge. Results of studies24,37 on alcohol use among patients with heart failure indicate that 25% to 40% of patients with heart failure do not understand the risks of alcohol consumption. Efforts to educate patients about the detrimental effects of alcohol on cardiac function should be reinforced, and resources should be provided that can facilitate alcohol-withdrawal

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<tr>
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Figure 3  Patient medication chart with clock.

Table 2  Web sites offering low sodium recipes and food suggestions

- www.lowsaltfoods.com
- www.alsosalt.com/lowsodiumfoods.html
- www.dinewise.com/low_sodium
- http://www.americanheart.org/presenter.jhtml?identifier=572
- www.hfsa.org/pdf/module2.pdf
- www.drugs.com/cg/2-gram-sodium-diet.html
efforts. Support group therapy and alcohol cessation programs may offer support to patients who find it difficult to stop consuming alcohol.

Motivation for making behavioral lifestyle changes may be low in patients who are not ready to commit to making those changes. Despite education on lifestyle changes that are necessary when living with heart failure, many patients are not ready to learn how to manage their illness. Some patients are more prepared than others to hear the information and make the appropriate lifestyle changes. For that reason, it is important to determine each patient’s level of readiness to make lifestyle changes and then individualize the educational sessions to the patient’s level of readiness.38,39 For instance, if a patient states that he or she does not wish to follow a low-sodium diet, simply handing the patient written information on that topic may have limited benefit. However, exploring patients’ dietary preferences with them and tailoring recipes and spice suggestions may offer appealing ideas to patients. If a patient enjoys foods cooked with garlic salt, perhaps a combination of garlic powder and onion powder will be pleasing to the patient. Patients should be encouraged to experiment with low-sodium spices that suit their personal tastes.

Methods of Discharge Instruction

The methods and delivery of patient education are varied and may be important to outcomes. Education of patients consists of 5 steps, beginning with assessment of a patient’s knowledge, learning abilities, learning styles, cognitive level, and motivation.25 Next, the patient’s learning needs and barriers to learning must be determined. The third step includes discussion with the patient to plan the educational intervention and set goals. In the fourth step, the education and information is delivered to the patient and the patient’s family as planned. The last step includes evaluation of the learning process. Strategies that fit with the patient’s learning styles, cognitive level, and motivation by using tailored interventions offer a directed way to enhance compliance among patients.6,7,23,25-27,29,30,34-40 Practical ideas for improving patients’ adherence are listed in Table 3.

Nurses are crucial to the success of education and can increase the probability of optimal discharge instruction and better outcomes by using better education strategies.25

Written Materials

Patients with heart failure recognize the importance of discharge education. When asked about what information is important, patients ranked information on medication and signs and symptoms as most important, followed by general education about heart failure, risk factors, prognosis, activity, psychological factors, and diet.46-48 The method of teaching patients varies from patient to patient, depending on multiple factors. Patients’ educational level dictates their ability to comprehend written information, and poor visual acuity limits the benefit of written materials. Language barriers must be considered in non–English-speaking communities. All printed material must be written at an appropriate reading level that will meet the needs of a wide variety of patients. Researchers in one study49 showed that an educational intervention including written materials specifically directed at patients with low literacy (less than ninth-grade literacy level) and supportive phone calls was associated with improvements in self-care behaviors and signs and symptoms related to heart failure.

One-on-One Sessions

One-on-one sessions between a nurse or multidisciplinary team member and a patient are an important component of education at discharge. In a trial50 of 223 patients with heart failure, researchers compared the effects of a 1-hour, one-on-one teaching session with a trained nurse educator with the effects of the standard discharge teaching done by the staff. Patients in the education group also received a copy of the treatment guidelines for heart failure written in nonmedical, patient-friendly language. Patients receiving the educational intervention had a 35% lower risk of readmission or death. The intervention patients also reported increased self-care practices. Compared with controls, they were more likely to weigh themselves daily (66% of intervention patients vs 51% of controls, \( P = .02 \)), follow a sodium-restricted diet (32% vs 20%, \( P = .05 \)), and stop smoking (97% vs 90%, \( P = .03 \)).

A prospective, randomized trial51 was conducted to determine the effect of a formal education and support intervention on 1-year readmission or mortality and costs of care for patients hospitalized with heart failure. The intervention consisted of an experienced cardiac nurse conducting an hour-long session covering each patient’s knowledge of the
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<th>Strategy</th>
<th>Evidence or rationale supporting strategy</th>
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<td><strong>Provider led</strong></td>
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<td>Nurse- or pharmacist-led disease management interventions</td>
<td>Readmission rates for heart failure significantly decreased when a cardiac nurse educator was used to coordinate an inpatient heart failure education program with comprehensive discharge planning23 90 days after discharge, multidisciplinary intervention reduced all-cause admissions by 44% compared with usual care; heart failure admissions decreased by 56%41</td>
<td>Initiate or increase current involvement in a multidisciplinary program</td>
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<td>In-hospital initiation of medication</td>
<td>At 60 days, 91.2% of patients started on β-blockers before discharge remained on therapy, compared with 73.4% who started taking the drugs after discharge40</td>
<td>Assess patient’s knowledge of medications before discharge  Provide prescriptions for medications at discharge</td>
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<td>Improvement in communication between provider and patient about medication</td>
<td>Improved communication with patients with heart failure before discharge resulted in a 16% reduction in mortality, 14% decrease in readmissions, and 31% decrease in heart failure–related rehospitalization, with 1 life saved for 34 patients treated42</td>
<td>Confirm that patient has been fully informed about medication before discharge  Provide written educational material</td>
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<td>Reduction in the complexity of drug regimens</td>
<td>Patients on once-daily therapy had significantly greater adherence than did patients on twice-daily therapy43 Combination medications can increase adherence44</td>
<td>Consider once-daily therapy and/or use of polypharmacy if appropriate</td>
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<td>Avoidance of medications with known adverse effects</td>
<td>Adverse effects can decrease quality of life and prevent patients from adhering to treatment with some agents46</td>
<td>Provide patient with a list of possible adverse effects from medications; include discussion of sexual dysfunction as a potential adverse effect</td>
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<td>Discussion of adherence during normal follow-up care</td>
<td>In 39% of encounters, providers did not ask patients about the medications patients are taking45</td>
<td>Confirm that patient has been fully informed about medication at follow-up</td>
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<td>Heightened awareness of the possibility of poor adherence</td>
<td>Education level, insurance, socioeconomic status, advanced age, cognitive impairment, and depression may be predictive of poor adherence49</td>
<td>Note patient-specific barriers or special circumstances</td>
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<td>Awareness of limitations: vision, hearing, mobility, and cognition (memory)</td>
<td>Use of larger text and pictures, a mild exercise plan, slower teaching pace, increased repetition of information, and involvement of family can lessen the impact of patients’ limitations50</td>
<td>Tailor education method and/or material to the individual patient’s needs or limitations</td>
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<td>Awareness of low motivation (evaluation of fatigue and depression) and low self-esteem</td>
<td>A nonthreatening climate, positive feedback, and a trusting relationship between health care provider and patient can improve a patient’s self-esteem51</td>
<td>Provide more context about why the patient’s heart failure plan is important  Encourage treatment of fatigue and depression</td>
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<td>Use of multiple educational materials</td>
<td>Patients with heart failure are often discharged with complex treatment regimens52</td>
<td>Provide written material, brochures, booklets, newsletters, videos, CDs, and Web-based programs to increase patient’s exposure to material about heart failure</td>
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<td>Use of multidisciplinary involvement</td>
<td>A team approach to patient education can reduce hospital readmission rates and costs27</td>
<td>Include dietitian, respiratory therapist, physical therapist, pharmacist, and social worker in discussions</td>
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<tr>
<td><strong>Patient led</strong></td>
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<td>Active participation in disease management</td>
<td>Lack of adherence to medications, failure to follow a salt-restricted diet, and delays in seeking medical attention are primary reasons for the high rate of rehospitalization among patients with heart failure6</td>
<td>Advise patients to write down questions in order to remember them and ask when the physician or nurse is present  Suggest that patients attend support groups or teaching sessions, read all literature that is provided, and watch all CDs or videos</td>
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illness, the relation between medications and illness, the relationship between health behaviors and illness, early signs and symptoms of worsening heart failure, and when and where to obtain assistance. Patients’ understanding of the top-ics was assessed and reviewed to provide information about gaps in patients’ knowledge for the nurse to address. In subsequent follow-up sessions (by telemonitoring), the nurse reviewed knowledge and provided support for patients to reinforce the initial educational foundation, theoretically by empowering patients and offering strategies to improve adherence. The intervention was associated with a 39% decrease in the total number of readmissions.51

In another study,52 179 patients with heart failure were randomized either to usual care or to a nurse education initiative (consisting of intensive, systematic, and planned education by a study nurse about the consequences of heart failure in daily life) both in the hospital and 1 week after discharge. In addition to evidence-based education such as recognition of warning signs and symptoms of worsening heart failure, problems of individual patients such as social interaction, sexual function, and limited access to the general practitioner were discussed. During the hospital stay, the study nurse assessed each patient’s needs, provided education and support to the patient (and the patient’s family), gave the patient a card listing the warning signs and symptoms, and discussed discharge. Within 1 week after discharge, the study nurse telephoned the patient to assess potential problems and reinforced and continued education as warranted. One month after discharge, patients from the intervention group reported complying with 14 of the 19 self-care behaviors, vs 12 behaviors for the control group. The increase in self-care behavior from baseline to 9 months was significant in the intervention group ($t = 4.9, P < .001$) but not in the control group ($t = 1.9, P = .06$).

### Social Support

Support from people close to a patient with heart failure is often important to success. For example, patients who are married tend to have a greater knowledge about their disease.24 The self-management of dietary restrictions is difficult and usually occurs within the context of family; therefore, a family education intervention was tested for the effect on improving self-management related to sodium intake.53 Patients with heart failure and a family member received either (1) in-depth education and counseling (in both verbal and written form, a video on heart failure care, and individualized dietary discussion and feedback to promote knowledge as well as self-efficacy in selecting and preparing low-sodium foods) by a nurse expert and a dietitian or (2) the same in-depth education, counseling, and feedback by the same research nurse

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<td>Patient led</td>
<td>Noncompliance with medication and diet can be as high as 64% and 22%, respectively27 Noncompliance rates with smoking cessation and abstaining from alcohol can be as high as 69.5% and 71%, respectively28</td>
<td>Encourage patients to be open and honest in all discussions with health care providers</td>
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<td>Understanding basic aspects of disease</td>
<td>Greater medication knowledge, skills, and adherence are associated with fewer visits to the emergency department7</td>
<td>Encourage patients to ask health care providers to explain the disease and its consequences, and to ask for referral to other educational sources (eg, Web site) for more information</td>
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<td>Understanding complex dosing schedules</td>
<td>Strategies to improve dosing schedules include the use of pill boxes to organize daily doses, asking the physician if the regimen can be simplified, and cues to remind patients to take medications29</td>
<td>Provide patients with a take-home medication chart showing timing of dose and photograph of tablets</td>
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<td>Need for family support</td>
<td>Educational interventions involving patients and their family members can be effective in improving adherence30</td>
<td>Suggest that patients bring family members to follow-up and share care plans with them</td>
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and dietician plus 2 additional sessions focused on enhancing family support and patients’ choice through communication and empathy. Self-reported dietary sodium intake and 24-hour urinary levels of sodium, a reflection of dietary sodium intake, were measured at baseline and 3 months after the intervention.

Both groups had decreases in dietary sodium intake and sodium level in the urine at 3 months; however, the group with the additional 2 sessions that focused on family support had greater decreases in the levels of sodium in the urine (mean [standard deviation], 3438 [1205] mg decreased to 2612 [1255] mg in the intervention group vs 2945 [1606] mg decreased to 2932 [1747] mg in the control group) and had a greater percentage of those with 15% decreases in levels of sodium in the urine (67.9% of intervention patients vs 40.7% of control patients, \( P = .04 \)).

**Motivation**

A motivational intervention is one that increases the likelihood of a person choosing, continuing, and completing a change strategy. A behavioral management intervention was designed to augment usual care and to help patients with heart failure establish healthier behaviors to improve their quality of life.\(^5^4\)

Two advanced practice nurses facilitated the intervention, which included group classes and individual follow-up with telephone calls. The intervention was evaluated by receiving feedback from the participants about their satisfaction and anecdotal information from the class leaders. Patients reported high satisfaction with the intervention. When motivation was defined as “choosing, continuing, and completing a behavioral change,” the intervention was partially successful; patients were able to choose and begin a change strategy but did not follow through in continuing and completing the strategies. Readiness to change behavior and perceived control should be considered for future studies to examine how these factors influence learning, motivation, and behavioral change. Research with a motivational model may facilitate behavioral change and improve the quality of life of patients with heart failure.

**Education of Patients After Discharge**

Follow-up after hospitalization can reinforce the education that was delivered at discharge. In a study\(^5^5\) of home-based care after discharge, the intervention involved a nurse visiting the patient once at home after discharge to teach the patient about heart failure and the medications. A reduction in heart failure events (38 vs 51; \( P = .04 \)) and unplanned readmissions (68 vs 118; \( P = .03 \)) was seen in those patients receiving the follow-up visit at home compared with the control group.\(^5^4\) In a study\(^5^6\) of 106 patients assigned to either follow-up at a nurse-led heart failure clinic or usual care, fewer patients in the intervention group than in the control group died or had to be admitted to the hospital after 12 months (29 vs 40; \( P = .03 \)). All patients answered a questionnaire after 3 and 12 months to evaluate their self-care behaviors, and the intervention group scored significantly higher than the control group did (\( P = .02 \) after 3 months and \( P = .01 \) after 12 months).\(^5^6\)

In another study,\(^5^7\) researchers assessed the long-term effectiveness of a disease management program that combined discharge planning, education, optimization of therapy, improved communication, early attention to signs and symptoms, and intensive follow-up. After 2 years, all-cause death and hospital admissions for heart failure were 36% lower in the intervention group than in the usual-care group. Compared with baseline, patients in the intervention group reported significant improvements in functional status, quality of life, and rate of prescription of \( \beta \)-blockers.

Telephone monitoring is a possible tool to reinforce education and assess patients’ status. Remote titration of the dose of \( \beta \)-blocker carvedilol by advanced practice nurses was studied in patients with heart failure.\(^5^8\) Before therapy, the nurses instructed patients about the side effects of \( \beta \)-blockers, how to take a pulse, and monitoring weight. Three times a week, patients reported their weights, vital signs, and symptoms to the nurses by phone. The advanced practice nurses counseled, educated, and reminded patients to increase the dose of carvedilol every 2 weeks until the target dose was reached. As a result of this intervention, 96% of patients reached a therapeutic dose (6.25 mg twice daily), and 71% of patients reached target doses of 25 mg twice weekly in approximately 8 weeks. No hospitalizations for heart failure occurred during this period.\(^5^8\) Another study\(^5^9\) included 14 randomized controlled trials (4264 patients) of remote monitoring (telemonitoring and/or structured telephone support) to determine if such monitoring improved outcomes in patients with heart failure. Remote monitoring
programs reduced the rates of hospital admissions related to heart failure by 21% and the rate of all-cause mortality by 20%. New technologies such as telemonitoring can be helpful tools to improve education but should be used as an addition to a comprehensive educational discharge program.

**Comprehensive Approach**

Although they may have been focused on a single tactical method, most of the studies mentioned investigated the value of a comprehensive educational program that included a combination of inpatient and outpatient education. The more comprehensive an educational strategy is, the better. For instance, in one study patients with heart failure were randomized to receive either usual care or a nurse-directed, multidisciplinary intervention that included a review of patients’ conditions and their medications, home visits, dietary advice, and telephone calls. At follow-up 90 days after discharge, the multidisciplinary intervention had reduced all-cause admissions by 44% \((P = .02)\) compared with usual care, and admissions for heart failure were reduced by 56% \((P = .04)\).

In a study of the potential benefits of comprehensive management of elderly patients with heart failure, the intervention consisted of an experienced cardiac nurse educator who coordinated a targeted education program for inpatients with heart failure coupled with comprehensive discharge planning and immediate outpatient reinforcement through a coordinated nurse-managed home health care program. After 30 to 60 days, the readmission rate for heart failure in the usual-care group was 6 times the rate in the intervention group. After 6 months, the readmission rate in the usual-care group was nearly 4 times the rate in the intervention group \((44.2\% vs 11.4\%; P = .01)\).

In another study of 165 hospitalized patients with heart failure who were randomized to either a comprehensive nurse intervention or usual care, the nurse intervention included educating patients about the disease and its treatment, including training in how to adjust dosages of diuretics, as well as home visits, telephone contact, extensive monitoring of each patient, and up-titration of medication. Patients in the nurse intervention group had fewer all-cause admissions than did patients in the control group \((86 vs 114, P = .02)\), had fewer admissions for heart failure \((19 vs 45, P < .001)\), and spent significantly fewer days in the hospital for heart failure \((mean, 3.43 \text{ days vs } 7.46 \text{ days}, P = .005)\).

**Summary**

Although much of the literature has been devoted to programs to improve the process of care, less attention has been paid to the comprehensive strategies provided by specially trained nurses that have improved outcomes for patients with heart failure. When studied in the context of multidisciplinary teams, specialists contribute significantly to improving outcomes. In a review of 29 trials of multidisciplinary management programs, McAlister et al found that 1 of the 3 elements crucial to a successful program is the use of nurses who are knowledgeable about heart failure.

Providing comprehensive discharge education to patients with heart failure is essential to improving outcomes, and cardiac nurses are in a position to take on the role of educators. Patients with heart failure should understand their condition, their medications, and when to seek medical treatment. As more is learned about the important effects of education and self-care on patients’ outcomes, the need to move away from the traditional view of patients as passive recipients of information is clear. Patients should be viewed as active partners in the management of their health.

Cardiac nurses play a fundamental role in the educational process and can be the primary practitioners who teach and evaluate patients’ self-care abilities, which include weight monitoring, sodium and fluid restrictions, physical activities, regular medication use, monitoring signs and symptoms of disease worsening, and early search for medical care. Cardiac nurses should strive to understand the barriers to patient adherence and self-care and learn strategies to educate patients to overcome those barriers. A discharge management program led by a cardiac nurse that incorporates the latest evidence, guidelines, and tools can substantially improve the level of care for patients with heart failure.
References


Hospital Discharge Education for Patients With Heart Failure: What Really Works and What Is the Evidence?
Sara Paul

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