Guidelines

Heart Failure Management in Skilled Nursing Facilities

A Scientific Statement From the American Heart Association and the Heart Failure Society of America

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Heart failure (HF) is a complex syndrome in which structural or functional cardiac abnormalities impair the filling of ventricles or left ventricular ejection of blood. HF disproportionately occurs in those ≥65 years of age.[1] Among the estimated 1.5 to 2 million residents in skilled nursing facilities (SNFs) in the United States, cardiovascular disease is the largest diagnostic category, and HF is common.[2,3] Despite the high prevalence of HF in SNF residents, none of the large randomized clinical trials of HF therapy included SNF residents, and very few included patients >80 years of age with complex comorbidities.

Several issues make it important to address HF care in SNFs. The healthcare environment and characteristics of SNF residents are distinct from those of community-dwelling adults. Comorbid illness unrelated to HF (eg, dementia, hip fracture) increases with age >75 years, and these conditions may complicate both the initial HF diagnosis and ongoing management.[4–6] Morbidity and mortality rates are significantly increased for hospitalized older adults with HF discharged to SNFs compared with those discharged to other sites.[7] Transitions between hospitals and SNFs may be problematic.[8] SNF 30-day rehospitalization rates for HF range from 27% to 43%,[7,9,10] and long-term care residents sent to the emergency department are at increased risk for hospital admission and death.[11] The purpose of this scientific statement is to provide guidance for management of HF in SNFs to improve patient-centered outcomes and reduce hospitalizations. This statement addresses unique issues of SNF care and adapts HF guidelines and other recommendations to this setting.

Methods

This scientific statement on HF management in SNFs was developed by a writing group of experts representing nursing, medicine (cardiology, geriatrics, nursing home physicians, and palliative medicine), pharmacology, physical therapy, dietary clinical management, research, and quality of care. Sponsors

See page 286 for disclosure information.

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Table 1. Classification of Recommendations and Level of Evidence

ESTIMATE OF CERTAINTY (PRECISION) OF TREATMENT EFFECT	SIZE OF TREATMENT EFFECT			
	CLASS I *Benefit >>> Risk* Procedure/Treatment **SHOULD** be performed/ administered	**CLASS IIa** *Benefit >> Risk* *Additional studies with focused objectives needed* **IT IS REASONABLE** to perform procedure/administer treatment	**CLASS IIb** *Benefit ≥ Risk* *Additional studies with broad objectives needed; additional registry data would be helpful* Procedure/Treatment **MAY BE CONSIDERED**	**CLASS III** *No Benefit* or **CLASS III** *Harm* Procedure/ Test / Treatment COR III: No benefit — Not Helpful — No Proven Benefit COR III: Harm — Excess Cost w/o Benefit or Harmful — Harmful to Patients
LEVEL A Multiple populations evaluated* Data derived from multiple randomized clinical trials or meta-analyses	■ Recommendation that procedure or treatment is useful/effective ■ Sufficient evidence from multiple randomized trials or meta-analyses	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from multiple randomized trials or meta-analyses	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Sufficient evidence from multiple randomized trials or meta-analyses
LEVEL B Limited populations evaluated* Data derived from a single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is useful/effective ■ Evidence from single randomized trial or nonrandomized studies	■ Recommendation in favor of treatment or procedure being useful/effective ■ Some conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation's usefulness/efficacy less well established ■ Greater conflicting evidence from single randomized trial or nonrandomized studies	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Evidence from single randomized trial or nonrandomized studies
LEVEL C Very limited populations evaluated* Only consensus opinion of experts, case studies, or standard of care	■ Recommendation that procedure or treatment is useful/effective ■ Only expert opinion, case studies, or standard of care	■ Recommendation in favor of treatment or procedure being useful/effective ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation's usefulness/efficacy less well established ■ Only diverging expert opinion, case studies, or standard of care	■ Recommendation that procedure or treatment is not useful/effective and may be harmful ■ Only expert opinion, case studies, or standard of care
Suggested phrases for writing recommendations	should is recommended is indicated is useful/effective/beneficial	is reasonable can be useful/effective/beneficial is probably recommended or indicated	may/might be considered may/might be reasonable usefulness/effectiveness is unknown/unclear/uncertain or not well established	COR III: No Benefit is not recommended is not indicated should not be performed/ administered/ other is not useful/ beneficial/ effective COR III: Harm potentially harmful causes harm associated with excess morbidity/mortality should not be performed/ administered/ other
Comparative effectiveness phrases†	treatment/strategy A is recommended/indicated in preference to treatment B treatment A should be chosen over treatment B	treatment/strategy A is probably recommended/indicated in preference to treatment B it is reasonable to choose treatment A over treatment B		

A recommendation with Level of Evidence B or C does not imply that the recommendation is weak. Many important clinical questions addressed in the guidelines do not lend themselves to clinical trials. Although randomized trials are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

*Data available from clinical trials or registries about the usefulness/efficacy in different subpopulations, such as sex, age, history of diabetes, history of prior myocardial infarction, history of heart failure, and prior aspirin use.

†For comparative effectiveness recommendations (Class I and IIa; Level of Evidence A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

(the American Heart Association [AHA] and the Heart Failure Society of America) identified specific members of the writing group, and others were selected on the basis of known expertise. A literature search was performed using the key words *skilled nursing facility*, *long-term care facility*, *nursing home*, *palliative medicine*, *rehabilitation*, *exercise*, *discharge*, *post-hospital*, and *post-acute* meshed with the key word *heart failure* in PubMed and Ovid. Peer review was performed by experts from scientific societies (American Association of Heart Failure Nurses, AHA, and Heart Failure Society of America). The Classification of Recommendations and Level of Evidence for this statement are described in Table 1.

Definitions

The nomenclature of long-term care facilities varies with locality and region.[12] Long-term care encompasses multiple venues defined by the level of services provided and reimbursement. For the purpose of this scientific statement,

SNFs are Medicare-certified posthospital care units or long-term care facilities that have at least 16 hours per day of licensed nursing care, 7 days per week. This statement does not address care in other long-term care venues, such as assisted living or custodial care. We use *SNFs* to include facilities traditionally called *nursing homes*. HF patients in SNFs may be those receiving postacute care after HF exacerbation, or after illness or surgery, as well as long-term residents of SNFs who meet the above definition of nursing care. This population is fluid, and some patients will enter postacute care, not recover sufficiently to leave the facility, and move to long-term care. Nursing staff in SNFs also may move between providing care on postacute units and long-term care units.

Pathogenesis and Precipitating Factors for HF

Hypertension is the most common cause of HF in older women, particularly those with preserved ejection fraction.[13] In older men, HF is more often attributable to coronary artery disease. Older people have an increased risk of ischemic heart disease, because aging is associated with endothelial dysfunction and progression of underlying coronary artery disease, as well as a decrease in capillary density and decreased coronary reserve, which can lead to insidious myocardial ischemia.[14] In the Cardiovascular Health Study, the presence of coronary heart disease was associated with an 87% increased risk of HF despite the prevalence of hypertension being over twice as high as that of coronary heart disease. Among those with coronary heart disease, the population attributable risk for incident HF was 13%.[15] The population attributable risk is likely to be higher in the SNF population. Other potential causes include valvular heart disease (especially aortic stenosis and mitral regurgitation) and nonischemic cardiomyopathy (Table 2). Importantly, HF in the elderly is frequently multifactorial, and it is thus essential to identify all potentially treatable causes. Factors precipitating or contributing to HF exacerbations are outlined in Table 3. These precipitants may be particularly important for patients with HF who are admitted to a SNF for an unrelated problem.

Epidemiology of HF in SNFs

The epidemiology of HF among SNF residents has not been well described. The precise prevalence of HF among SNF residents is unknown, with estimates ranging between 20% and 37.4%.[2,16–19] Of the estimated 1 492 200 Americans (nearly 0.5% of the total US population) living as long-term residents in SNFs,[3] 1 317 200 (nearly 90%) were ≥65 years of age, representing nearly 5% of the population aged ≥65 years. More than 70% of these were women, and nearly half were ≥85 years old. Close to 60% of long-term SNF residents are cognitively impaired.[19,20] An estimated 63 800, or 4.3% of long-term SNF residents, had a primary diagnosis of HF during admission, and ≈70 000 (4.7%) had a primary diagnosis of HF during this 2004 survey.[3] Many postacute patients are admitted to SNFs with other disease processes as the primary issue, with HF as a secondary diagnosis. However, no studies describe the epidemiology of the postacute SNF population. The usual long-term SNF resident is a white, non-Hispanic single female in her mid-80s[10] with severe functional impairment,[21] with 3 to 5 diagnoses, 1 of which is heart disease, and taking 9 medications.[22]

In a study of hospitalized SNF residents based on National Hospital Discharge Surveys 2005 and 2006, the prevalence of HF was nearly 30%.[2] Similarly, in a 10% random

Table 2. Potential Causes of HF in Older Adults

Hypertensive heart disease
Hypertensive hypertrophic cardiomyopathy
Coronary artery disease
Acute myocardial infarction
Chronic ischemic cardiomyopathy
Age-related diastolic dysfunction
Valvular heart disease
Aortic stenosis or insufficiency
Mitral stenosis or insufficiency
Infective endocarditis
Cardiomyopathy
Dilated (nonischemic)
Alcohol
Chemotherapeutic agents
Inflammatory myocarditis
Idiopathic
Hypertrophic
Obstructive
Nonobstructive
Restrictive (especially amyloid)
Pericardial disease
Constrictive pericarditis
High-output syndromes
Chronic anemia
Hyperthyroidism
Arteriovenous shunting

HF, heart failure.

Table 3. Common Factors Contributing to HF Exacerbations in Older Adults

Myocardial ischemia or infarction
Uncontrolled hypertension
Dietary sodium excess
Medication nonadherence
Excess fluid intake, either oral or intravenous
Arrhythmias
Supraventricular, especially atrial fibrillation
Bradycardia, especially sick sinus syndrome
Associated medical conditions
Infections, especially pneumonia, sepsis, or urinary tract infection
Anemia
Renal insufficiency (eGFR <30 mL/min)
Pulmonary embolism
Hypoxemia attributable to chronic lung disease
Drugs and medications
β-Adrenergic blockers (including ophthalmic agents)
Calcium channel blockers
Antiarrhythmic agents
Nonsteroidal anti-inflammatory drugs
Glucocorticoids
Mineralocorticoids
Provider/system factors (eg, medication reconciliation errors)

eGFR, estimated glomerular filtration rate; HF, heart failure.

sampling of 1840 SNFs during 2003 to 2004, 37.4% of the 500 322 SNF residents had HF.[17] Their mean age was 81 years, and two-thirds were women; 11% were black, 3% were Hispanic, and 1% were Asian. Comorbidities were common, with chronic obstructive lung disease, diabetes mellitus, cerebrovascular disease, and peripheral artery disease each present in >30% of patients. In this large sample, the annual HF hospitalization rate was 52%, and the annual mortality rate was 46%.[17] People who died or were hospitalized for HF were older and had more comorbidities and worse activities of daily living (ADL) function and cognition than those who survived and were not hospitalized. Modest geographic differences were observed for both death and HF hospitalization.[17] Prior epidemiological studies have used "nursing home" populations but did not differentiate rates between postacute and long-term residents.

Posthospital Morbidity and Mortality

Compared with patients with HF who return home after hospitalization, patients discharged to SNFs after hospitalization for acute HF are older, have longer lengths of stays, are more likely to be women, and have multiple comorbidities,[23] hypotension, higher ejection fraction, and absence of ischemic heart disease.[7] Although HF is the leading cause of hospitalization and rehospitalization for Medicare patients,[24] clinical outcomes of patients discharged to SNFs after HF hospitalization have not been well studied.[7] Data available suggest that HF patients discharged to SNFs are at very high risk for rehospitalization and death. An observational analysis of 15 459 fee-for-service Medicare beneficiaries aged ≥65 years discharged alive after hospitalization for HF in 2005 and 2006[7] found 24.1% of patients were discharged to a SNF. These patients experienced very high rates of adverse events, with more than half the patients not surviving for 1 year. Unadjusted postdischarge all-cause mortality was markedly higher for HF patients discharged to SNFs than for HF patients discharged elsewhere, with a 30-day mortality rate of 14.4% versus 4.1% and 1-year mortality rates of 53.5% versus 29.1%, respectively (P for both, <.0001). All-cause rehospitalization rates also were very high in patients discharged to a SNF and moderately higher than for their non-SNF counterparts (30-day rehospitalization rate 27.0% versus 23.5% and 1-year rehospitalization rate 76.1% versus 72.2%, respectively; $P < .0001$). Adjustment for patient characteristics partially attenuated the association between SNF discharge status and clinical outcomes. However, after adjustment for multiple prognostic variables, discharge to a SNF after HF hospitalization remained independently associated with increased death (hazard ratio, 1.76; 95% confidence interval, 1.66−1.87) and rehospitalization (hazard ratio, 1.08; 95% confidence interval, 1.03−1.14).[7] Similarly, avoidable hospitalizations are common in the general SNF population, many of whom have HF as a comorbidity.[25−28] Examples of factors related to avoidable hospitalizations include lack of on-site primary care clinicians, lack of timely laboratory testing, lack of integration of HF assessment and interventions into nursing care, and large resident to clinical staff ratios.[9,27,29,30] Given the paucity of outcome data for HF patients in SNFs, further studies that provide longitudinal data regarding the range of patient experiences after hospital discharge to a SNF are needed.

Comprehensive SNF HF Care

Clinical Diagnosis of HF

Comprehensive SNF HF care begins with accurate identification of residents diagnosed with HF. The clinical diagnosis of HF may largely rely on data from care before SNF admission. Residents without an HF diagnosis who develop pulmonary congestion or volume overload should have a physical examination, chest radiograph, and blood chemistry tests to confirm congestion and volume overload within the SNF setting if possible. Results from laboratory tests may take 24 hours or longer to return in SNFs; thus, appropriate clinical assessment and management should not be delayed. For SNFs without in-house chest radiograph equipment, radiographs can be obtained by companies that provide portable radiography services, but the majority of these provide only a report versus actual films for review. An echocardiogram usually requires that the resident be transported to a hospital or cardiology practice.

Goals of Management for HF Patients in SNFs

Patients entering into SNFs are a diverse group, but for this discussion we categorize them into 3 groups based on different clinical scenarios and goals. One, the "rehabilitation group," includes patients recently discharged from the hospital (with any diagnosis) with the goal to recover independent function and return to their prior residence after several weeks of skilled care. The second group, the "uncertain prognosis group" of patients, are often discharged from the hospital with complications, frailty, or multiple comorbidities, with hope of improvement, but recovery is less certain. These individuals go to a postacute skilled unit in the SNF, but their final disposition to home or a higher level of care depends on how well they recover with skilled care. The third group, the "long-term group," consists of SNF residents with frailty and dependency who are expected to remain in a SNF until death. The approach to HF care for these rehabilitation, uncertain prognosis, and long-term populations will vary depending to a large extent on the goals for their SNF admission. It is appropriate to clarify goals for all SNF residents. Table 4 outlines the application of HF guideline recommendations to the 3 different groups of patients in SNFs.[31]

Many patients admitted to SNFs have developed new dependencies in function.[32] A decline in physical function usually occurs with acute illness, before and during a hospitalization, and is a dynamic process for which hospitalization is a sentinel event.[33] For those patients discharged from

Table 4. Medical Management of HF in Relation to SNF Admission Goals

Intervention	Rehabilitation Group	Uncertain Prognosis Group	Long-Term Group
Assessment of LVEF	Yes	Yes	Preferable, needs to be individualized
Sodium restriction to achieve euvolemia	Preferable, needs to be individualized	Preferable, needs to be individualized	Preferable, needs to be individualized
Diuretic agents to achieve euvolemia	Yes	Yes	Yes
ACEIs/ARBs	Yes for HF*r*EF, individualize titration, avoid low SBP	Yes for HF*r*EF, low dose preferable, avoid low SBP	Yes for HF*r*EF, low dose preferable, avoid low SBP
β-Blocker*	Yes for HF*r*EF, as tolerated by BP, HR, fatigue†	Yes for HF*r*EF, as tolerated by BP, HR, fatigue†	Yes for HF*r*EF, as tolerated by BP, HR, fatigue†
Mineralocorticoid receptor antagonist	Yes for HF*r*EF NYHA II–IV and in NYHA III with IHD; avoid in those with eGFR <30 mL/min/m^2	Yes for HF*r*EF NYHA II–IV and in NYHA III with IHD; avoid in those with eGFR <30 mL/min/m^2	Yes for HF*r*EF NYHA II–IV‡ and in NYHA III with IHD; avoid in those with eGFR <30 mL·min^{-1}·1.73 m^{-2}
Hydralazine-nitrates (and in patients with contraindications or intolerance to ACEIs/ARBs for all 3 groups)	Yes for HF*r*EF in self-identified black patients, only if already receiving an ACEI or ARB, a β-blocker, and a mineralocorticoid receptor antagonist or if they have contraindications	Yes for HF*r*EF in self-identified black patients, only if already receiving an ACEI or ARB, a β-blocker, and a mineralocorticoid receptor antagonist or if they have contraindications	Yes for HF*r*EF in self-identified black patients, only if already receiving an ACEI or ARB, a β-blocker, and a mineralocorticoid receptor antagonist or if they have contraindications
Digoxin	Yes for HF*r*EF, only if symptomatic despite treatment with an ACEI or ARB, a β-blocker, and a mineralocorticoid receptor antagonist; low dose (≤0.125 mg/d)	Yes for HF*r*EF, only if symptomatic despite treatment with an ACEI or ARB, a β-blocker, and a mineralocorticoid receptor antagonist; low dose (≤0.125 mg/d)	Yes for HF*r*EF, only if symptomatic despite treatment with an ACEI or ARB, a β-blocker, and a mineralocorticoid receptor antagonist; low dose (≤0.125 mg/d)
Implantable cardioverter defibrillator	Stable optimized medications for 3 mo, LVEF ≤35%, NYHA II–III, and expected survival of at least 12 mo	Observe until recovery seems likely	Not indicated
Cardiac resynchronization therapy	Persistent symptoms, optimized medications for 3 mo, LBBB and LVEF ≤35% and QRS ≥150 ms and NYHA II–IV	Observe until recovery seems likely	Not indicated
LVAD	Rare SNFs may be able to provide care for LVAD patients with VAD team	No	No
Identify preferences for end of life	Yes	Yes	Yes
Assess and treat symptoms of HF	Yes	Yes	Yes

ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; BP, blood pressure; eGFR, estimated glomerular filtration rate; HF, heart failure; HF*r*EF, HF with reduced ejection fraction; HR, heart rate; IHD, ischemic heart disease; LBBB, left bundle-branch block; LVAD, left ventricular assist device; LVEF, left ventricular ejection fraction; NYHA, New York Heart Association functional class; SBP, systolic blood pressure; SNF, skilled nursing facility; VAD, ventricular assist device.

*Carvedilol, metoprolol succinate extended release, and bisoprolol are the only evidence-based, guideline-recommended β-blockers for systolic HF. If patients are taking other β-blockers, they should be converted to 1 of the 3 listed above.

†Data support improved function and reduced HF symptoms with these drugs in the long run, but there are no data on HF patients ≥80 years of age or those living in SNFs.

‡NHYA class improved for 40% in RALES (Randomized Aldactone Evaluation Study). Only 20% of real-world octogenarians with HF (eg, patients seen in routine clinical practice) would have been eligible to participate in RALES; 59% of RALES patients were ≥65 years old, 9% were 80 to 90 years old, none were ≥91 years old, and none were from SNFs.[31]

the hospital with a new disability in ADL, which includes bathing, dressing, toileting, transferring, continence, and feeding, only 30% will return to their prior level of functioning.[33] Gross motor coordination and manual dexterity, absence of cognitive impairment, and absence of significant weight loss are associated with a successful transition from SNF to home without disability.[34]

Frailty, defined as a compromised ability to cope with physiological stress, is common in SNF residents. Frailty is usually described by reduced function in multiple domains, including nutrition or body weight, muscle strength, mobility, activity tolerance, and sometimes cognition.[35–37] Although not synonymous with frailty, comorbidity (≥2 comorbid illnesses) is a pathogenetic risk factor for frailty.[36] Although ≈20% of SNF residents have a diagnosis of HF, almost 70% of a Medicare sample with a diagnosis of HF had ≥3 noncardiac comorbidities, and 40% had ≥5.[4,36–38] Frailty strongly correlates with HF.[39,40] Frailty also confounds patient assessment and tolerance of medical therapies and increases mortality.[41,42]

Management of Decompensated HF in SNF Residents

General concepts of management of decompensated HF, or volume overload resulting in worsened HF symptoms in SNFs, are similar to those for management of outpatients.

Decompensation is usually recognized by a gain in weight, worsened HF symptoms (eg, fatigue, dyspnea) or a decline in function. However, detecting changes in symptoms or function is complicated by factors such as cognitive impairment, sedentary lifestyles, and comorbid illnesses with overlapping symptom profiles.[38,43] Cognitive impairment potentially affects capacity to report symptoms. Absence of symptoms at rest does not necessarily indicate stable HF status.[44]

For residents with stable vital signs, diuresis in the SNF with oral or intravenous diuretic agents is appropriate. Residents' rehabilitation potential, overall status, and goals of care should determine whether they are to be hospitalized if initial diuresis does not succeed in the SNF. Rehabilitation patients in whom recovery and discharge to home are anticipated and those with uncertain goals should receive guideline-based care.[45,46] Long-term residents, particularly those who are dependent in ≥2 ADLs or who have moderate to severe dementia may be appropriate for SNF HF management without hospitalization. Dependence in ≥2 ADLs is associated with a generally poor prognosis. Furthermore, residents with moderate to severe dementia and HF decompensation may have a life expectancy of <1 year.[47] For failure of oral diuresis or further decompensation, rehabilitation patients and those patients or families who request more aggressive therapies should go to the emergency department. Patients with an uncertain rehabilitation prognosis should be transferred to the emergency department for symptom management when needed, if patient preferences are for aggressive care or goals include discharge from the SNF. Long-term residents with preferences focused on reducing symptoms rather than longevity can be managed in the SNF, possibly with hospice care.

On admission and with a change in status, goals of care should be identified. This conversation should include preferences for hospitalization in the event of HF decompensation. Furthermore, for a median duration of 7 days before overt HF decompensation, several signs and symptoms worsen.[48–50] Monitoring for presence of increasing fatigue, dyspnea on exertion, cough, edema, and weight gain should signal nursing staff to intervene to avoid further decompensation.

Recommendations

1. **Management of worsened congestion in SNF residents should be patient centered, highly individualized, and based on shared decision making between a knowledgeable, well-coordinated, proactive healthcare team and informed patients or family or based on their goals for care as expressed through a durable power of attorney when patients lack capacity. These goals should incorporate functional and cognitive status *(Class I; Level of Evidence C).***
2. **Initial management of volume overload is appropriate in the SNF. Nursing care staff should incorporate monitoring for symptoms and signs of volume overload and intervene to avoid symptomatic congestion *(Class I; Level of Evidence C).***
3. **Decisions to hospitalize a SNF resident for symptomatic refractory volume overload HF or to transition to end-of-life care in the SNF should be based on goals of care and functional and cognitive status after efforts to optimize medical management to prevent avoidable admissions *(Class I; Level of Evidence C).***
4. **In the absence of advance care planning to determine goals of care, decisions to hospitalize should be individualized on the basis of shared decision making between a knowledgeable, well-coordinated, proactive healthcare team and an informed patient and family *(Class I; Level of Evidence C).***

Pharmacological Therapy

Guideline-driven pharmacological therapy for HF should be continued for patients in a SNF.[46] Because this population is generally old and not well studied, caution and close monitoring for adverse effects (eg, hypotension and worsening renal function) are appropriate. Design of a pharmacological treatment strategy for a SNF resident with HF must be individualized. In this context, selection of specific pharmacological agents should involve consideration of whether the beneficial effects are aimed at modifying the natural history of HF, alleviating symptoms, or a combination of both. Pharmacy regulation in a SNF requires a clear diagnosis for each medication from prescribing clinicians and review by a pharmacist for potential adverse effects (including drug-drug and drug-disease interactions). On Medicare-reimbursed units, the SNF bears medication costs, which adds further incentive for an appropriate pharmacological regimen.

HF With Reduced Ejection Fraction. Numerous randomized controlled trials have examined a wide range of pharmacological agents for the treatment of HF with reduced ejection fraction (HF*r*EF), usually defined as an ejection fraction <45%. A detailed review of agents shown to be effective in reducing mortality or symptoms in HF*r*EF is beyond the scope of this document, but issues relevant to their use in SNFs will be briefly discussed.

Diuretic Agents. Diuretic agents are an essential component of HF symptom management and remain the most effective agents for relieving pulmonary congestion and edema.[46] However, although diuretic agents reduce symptoms and improve quality of life, there is no evidence that they decrease mortality. Older patients are at increased risk for worsening renal function and diuretic-induced electrolyte abnormalities, including hypokalemia, hyponatremia, and hypomagnesemia. Diuretic agents also activate neurohormones, and findings from propensity-matched studies in older HF patients suggest that chronic diuretic therapy may increase risk for death and hospitalization.[51] Diuretic dosages should be adjusted to maintain euvolemia, thereby alleviating symptoms and enhancing quality of life

while minimizing the adverse consequences of diuretic therapy. Diuretic agents require careful monitoring of volume status (using weight and physical examination), renal function, electrolytes, and orthostatic blood pressures. Once euvolemia is achieved, patients should be treated with the lowest dose to maintain that status. The diuretic dose may be further reduced with the addition of a low-salt diet.

Angiotensin-Converting Enzyme Inhibitors and Angiotensin Receptor Blockers. Angiotensin-converting enzyme inhibitors (ACEIs) decrease mortality and improve quality of life by reducing symptoms and enhancing exercise tolerance in patients with HF*r*EF. Importantly, most of the mortality reduction by ACEI is mediated by reduction of death attributable to pump failure.[52,53] Death attributable to pump failure is a more common mode of death than sudden cardiac death.[54,55] Therefore, an ACEI should be considered in SNF residents with HF*r*EF, and an angiotensin receptor blocker (ARB) is a suitable alternative for patients intolerant to ACEIs.

In the Studies of Left Ventricular Dysfunction (SOLVD) trial, one of the largest ACEI trials in HF*r*EF, only 36% of the patients were ≥65 years old. However, a subgroup analysis of the public-use copy of the SOLVD data suggests that ACEIs may be beneficial in older HF*r*EF patients.[56] Of note, none of the SOLVD participants were ≥81 years of age, a typical SNF resident age group. Furthermore, only 8 patients were 80 years of age.[57] In patients with stage III chronic kidney disease (estimated glomerular filtration rate 30−59 mL/min/1.73 m^2), ACEI or ARB therapy may be beneficial.[58] These drugs should be initiated at the lowest available dosage and may not need uptitration.[57] Both ACEIs and ARBs can cause worsening renal function and hyperkalemia, although they can also be protective against progression of end-stage kidney disease to dialysis.[59] Volume status, renal function, and blood pressure should be monitored closely, especially with new or increased doses of an ACEI/ARB. Also, combination ACEI/ARB therapy should be avoided because of an increased risk for adverse events without additional benefits.

β-Adrenergic Blockers. β-Blockers improve survival in patients with HF*r*EF by reducing both sudden cardiac death and death attributable to pump failure.[60−63] β-Blockers also improve survival for euvolemic patients with severe HF.[64] β-Blockers reduce hospitalizations for HF exacerbations and may decrease the risk of supraventricular (and ventricular) tachyarrhythmias, including atrial fibrillation. However, although β-blockers often increase left ventricular ejection fraction (LVEF), the effect of these agents on day-to-day quality of life is variable. Thus, although some patients experience substantial improvements in symptoms and exercise tolerance, others do not report a noticeable change in well-being, and some patients feel worse because of fatigue, diminished exercise tolerance, or increased dyspnea. In addition, SNF residents may be at increased risk for bradyarrhythmias during β-blocker therapy because of age-related changes in the conduction system, including impaired sinus node function (''sick sinus syndrome'') and slowing of conduction through the atrioventricular node.[65] Low systolic blood pressure does not preclude use of β-blocker therapy. Although risk for major clinical events is increased among patients with lower pretreatment systolic blood pressure, the Carvedilol Prospective Randomized Cumulative Survival (COPERNICUS) investigators reported treatment with carvedilol decreased risk of death or an HF hospitalization by 31%.[66] For SNF residents with favorable prognosis who value length of life, β-blocker therapy is appropriate. However, the mean age of patients enrolled in 3 β-blocker trials involving carvedilol and metoprolol succinate extended release was between 58 and 64 years.[67] In the Metoprolol CR/XL Randomized Intervention Trial in Chronic Heart Failure (MERIT-HF), metoprolol succinate extended release was equally effective in younger and older HF*r*EF patients.[68] However, in MERIT-HF, only 490 patients were 75 to 80 years of age, and none were ≥81 years of age, the typical age of SNF residents. Furthermore, the inclusion criteria of MERIT-HF would have disqualified 100% of real-world octogenarian HF*r*EF patients typically seen in clinical practice.[31]

For SNF residents with poor prognosis and a primary goal of maximizing quality of life, avoidance of β-blocker therapy would be reasonable, especially if the resident experiences significant adverse effects. For the large proportion of SNF residents between these 2 relative extremes, the potentially conflicting effects of β-blockers on long-term outcomes and short-term quality of life must be reconciled on an individual basis. Often, SNF residents tolerate a low to intermediate dose of a β-blocker (eg, 25%−50% of guideline-recommended target dose) without noticeable adverse effects, and this may represent a reasonable compromise in many cases, with the recognition, however, that the benefits of such doses are unsubstantiated.[60]

Mineralocorticoid Receptor Antagonists. The competitive antagonists of the aldosterone (or mineralocorticoid) receptor, spironolactone and eplerenone, reduce mortality and hospitalizations in patients with New York Heart Association (NYHA) functional class II to IV HF*r*EF and in those with an LVEF <40% after an acute myocardial infarction.[69−71] The effect of these agents on quality of life and exercise tolerance has not been well documented. These agents are contraindicated in patients with stage IV or V chronic kidney disease who are not undergoing dialysis. Treatment should begin with low doses, uptitrated slowly to a maximum dose of spironolactone 25 mg daily and eplerenone 50 mg daily, with the serum potassium level maintained between 4 and 5 mEq/L. For SNF residents with HF*r*EF, NYHA functional class II to IV symptoms despite appropriate medical therapy, and estimated glomerular filtration rate ≥30−59 mL/min/1.73 m^2, initiation of mineralocorticoid

receptor antagonist therapy is reasonable, so long as close monitoring can be ensured. In patients who do not fulfill these criteria, the value of mineralocorticoid receptor antagonists is unproven and the risks may outweigh the benefits; therefore, use of these agents in such cases should probably be avoided.

Hydralazine/Nitrates. The combination of hydralazine and oral nitrates reduces mortality in self-identified black patients with HF*r*EF when administered in conjunction with standard HF therapy. In addition, the combination is an acceptable alternative to ACEIs and ARBs in patients with contraindications or intolerance to renin-angiotensin system antagonists and may be used as adjunctive therapy in patients with advanced HF symptoms despite treatment with conventional agents. Few data are available on the use of hydralazine/nitrates in patients ≥75 years of age. Side effects from hydralazine (headaches, gastrointestinal disturbances, palpitations, angina) and nitrates (headaches, dizziness, flushing) are relatively common. This combination generally should be considered for patients who are already receiving β-blockers. Starting doses are hydralazine 10 to 25 mg and isosorbide dinitrate 10 mg, each administered 3 times daily, with titration to maximum dosages of hydralazine 75 to 100 mg 3 times per day and isosorbide dinitrate 30 to 40 mg 3 times daily.

Digoxin. In the Digoxin Investigation Group (DIG) trial, digoxin had no effect on mortality but significantly reduced HF hospitalization in both younger and older HF*r*EF patients. Subsequent post hoc analyses of the DIG trial data suggest that low-dose digoxin, as defined by a serum digoxin concentration <1.0 ng/mL, may be associated with improved survival in patients with HF*r*EF and NYHA functional class II to III symptoms.[72] Although digoxin was equally safe in younger and older adults in DIG, there are few data on octogenarians and SNF residents. As in most randomized controlled trials of HF, only 5% of the DIG participants were ≥80 years of age, and only 11 patients were ≥90 years of age.

Current guidelines recommend digoxin as adjunctive therapy to alleviate symptoms in advanced HF and reduce HF exacerbations in patients who fail to respond adequately to standard HF medications.[46] Because of age-related reductions in renal function and lean body mass, older patients, especially women, tend to require a lower dose of digoxin to achieve a therapeutic serum concentration (ie, 0.5−0.9 ng/mL). In HF patients in SNFs, digoxin should be used at the low dose of 0.125 mg daily. This dose is more likely to result in low serum digoxin concentration and eliminate the need for routine monitoring of serum digoxin concentration.[73] For frail older patients with renal insufficiency, digoxin should be started at an even lower dose, such as 0.125 mg every other day. The most common adverse effects of digoxin in the SNF setting are likely to be gastrointestinal disturbances (nausea, diarrhea, anorexia, abdominal discomfort), central nervous system disorders (altered mental status; visual disturbances, especially photopsia and chromatopsia; headache; weakness) and cardiac arrhythmias (both tachycardias and bradycardias). However, even at the higher doses used in the DIG trial, digoxin was relatively safe in older adults.[73] Digoxin may be used to control heart rate and relieve symptoms among patients with both low blood pressure and uncontrolled atrial fibrillation but who are intolerant of uptitration of β-blockers.

HF With Preserved Ejection Fraction. Approximately 50% of elderly with HF have HF with preserved ejection fraction (HF*p*EF; ie, HF with an ejection fraction ≥45%), including up to 40% of men and >60% of women. To date, no pharmacological agents have been shown to improve survival, and thus, the goals of therapy for HF*p*EF are to alleviate symptoms, improve quality of life, and reduce hospitalizations. Hypertension and coronary artery disease, both of which are highly prevalent in patients with HF*p*EF, should be managed in accordance with current practice guidelines. One caveat is that for those ≥80 years of age, systolic blood pressures up to 150 mm Hg are acceptable to avoid the adverse effects of lower blood pressure, such as falls and worsening renal function.[13,74] Diuretic agents should be used judiciously to relieve congestion while avoiding overdiuresis and prerenal azotemia. The ACEI perindopril, the ARB candesartan, and the β-blocker nebivolol may reduce hospitalizations in older patients with HF*p*EF.[75−79] In addition, perindopril improved NYHA functional class and exercise tolerance in one study.[76] Digoxin had no effect on either mortality or all-cause readmissions in patients with HF*p*EF in the DIG ancillary trial.[80] However, both digoxin (relative risk, 0.88; 95% confidence interval, 0.62−1.25) and candesartan (relative risk, 0.89; 95% confidence interval, 0.77−1.03) have similar effects on reducing hospitalization for worsening HF.[75,79,80] Precautions for the use of all of these agents in SNF residents are similar to those described for treatment of HF*r*EF.

Recommendations

1. **Pharmacotherapy for HF in SNF residents should be individualized and should include consideration of prognosis, goals of care, comorbid conditions, potential adverse effects, medication costs, and personal preferences *(Class I; Level of Evidence C).***
2. **Pharmacotherapy for HF*r*EF in SNF residents should generally be similar to that in community-dwelling older HF*r*EF patients. SNF residents, however, tend to be older and have a higher comorbidity burden. Both of these factors predispose SNF residents to increased risk for adverse drug effects, including drug-drug and drug-disease interactions *(Class I; Level of Evidence B).***
3. **Pharmacotherapy for HF*p*EF is aimed at alleviating symptoms, improving quality of life, and reducing HF exacerbations and associated hospitalizations. Drug selection should be guided by prevalent**

comorbidities and the observed response to specific therapeutic interventions and be consistent with the patient's/family's goals of care. Medications should be reviewed periodically to ensure appropriateness and effectiveness of therapeutic interventions and to avoid adverse effects, especially on function and cognition *(Class I; Level of Evidence C).*

Ancillary Interventions

Because regulations in SNFs are dictated by the Centers for Medicare and Medicaid Services, many ancillary interventions for older adults with multiple comorbidities are mandated for SNF residents. Additional requirements specifically for those with HF are listed in Table 5 as ancillary interventions.[81] SNFs are designed for rehabilitation and not for primary care, so the extent of disease-focused ancillary interventions provided will vary from SNF to SNF and between providers working in the SNF.

HF Management Within the Context of the SNF Regulatory Environment

SNFs are licensed and regulated by each state. All facilities receiving payment from Medicare or Medicaid are also subject to federal regulations, which are an important driver of care in SNFs. The Minimum Data Set (MDS) is a general assessment performed on all patients on admission and at key intervals. The MDS assists the Centers for Medicare and Medicaid Services with reimbursement, monitors SNF quality of care, and provides a clinical profile of the resident's status, function, and abilities. Presently, the MDS explicitly focuses on delirium, pain, and wounds; other chronic diseases receive little attention. Upcoming Centers for Medicare and Medicaid Services regulations (http://www.medpac.gov/documents/reports/jun13_entirereport.pdf) will focus on reducing rehospitalization rates for HF, so that incorporation of HF disease management into multidisciplinary care SNFs will gain importance.[82,83]

SNF Nursing Staff and Staff to Resident Ratios

The SNF nurse staffing composition is very different from the nurse staffing composition in acute care. In acute care, staffing consists of mainly registered nurses (RNs). In SNFs, nurse staffing is highly variable and includes predominantly unlicensed certified nursing assistants (CNAs) along with licensed RNs and licensed practical nurses (LPNs). There are no mandatory federal staffing ratios of nurses to residents or total staff to resident ratio for SNFs, and state requirements vary. In SNFs, unlicensed CNAs make up the vast majority of staff and are responsible for direct care at the bedside, such as weighing the resident, monitoring vital signs, and assisting with ADLs. The unlicensed CNA receives <1 year of training yet is an integral member of the healthcare team in the SNF. Each CNA cares for 6 to 8 residents on the day shift, with double or triple that number during the night. One RN or LPN is responsible for medication administration, skilled treatments including wound care, and assessment and monitoring of as many as 30 residents during the day. A higher resident assignment is common at night. Each facility determines nurse staffing to meet the needs of each resident. Minimum standards include 2.5 hours of nursing personal care each day, of which 20% must be by a licensed nurse (LPN or RN). A director of nursing, who must be an RN, oversees the comprehensive assessment of the residents' needs, including medically defined conditions; functional, nutritional, and psychosocial status; discharge and rehabilitation potential; and drug therapy. Guidelines for nurse staffing levels are set by the Joint Commission on Accreditation of Healthcare Organizations Accreditation Code[84]; however, few SNFs are accredited by the Joint Commission on Accreditation of Healthcare Organizations.

Table 5. Ancillary Interventions for Patients With HF and SNF Regulations

HF Guideline Recommendations*	SNF Regulatory Requirements
Vaccinations	
Influenza vaccine every Fall pneumococcal vaccine polyvalent: 1 dose at any age and repeat at age ≥65 y if prior dose was given before age 65 y and 5 y has elapsed since first dose	Identification of each patient's immunization status. Patient's record should document vaccination was administered unless there is satisfactory documentation as to why it was not administered. This includes precautions necessitating delay in vaccine administration, medical contraindication to vaccine, and resident refused or has already been immunized.
Smoking cessation	
Patients should be advised/counseled for smoking cessation†	No specific recommendations on smoking cessation.
Falls assessment/prevention	
Avoid SBP <120 mm Hg Avoid low heart rate	All patients are considered a fall risk in SNFs. SNF environment must remain free of accident hazards. Each resident must receive adequate supervision and assistance/devices to prevent accidents.
Dental care	
Encourage routine dental hygiene	Facility must assist resident in obtaining routine and emergent dental care.

HF, heart failure; SBP, systolic blood pressure; SNF, skilled nursing facility.
*Based on Riegel et al[81] and Centers for Disease Control and Prevention guidelines (http://www.CDC.gov/vaccines).
†Joint Commission on Accreditation of Healthcare Organizations core measure for HF.

Nursing Management

Application of HF guidelines for nursing staff in SNFs has been demonstrated in only a few studies.[9,85,86] Nursing care of HF patients in SNFs should include assessment of symptoms, weight monitoring by staff, medication management, dietary management, exercise with a focus on large muscle group strengthening, and patient education. A quality improvement project was completed in 4 northeastern SNFs.[85] Appendix 1 is an example of an HF-specific intake form. Appendix 2 is an example of a standing order protocol to guide nurses' (licensed and unlicensed) actions in the presence of symptoms, a list of what to include in handoffs, and resources for family education. A key component of the HF-specific baseline intake form is to determine whether the resident is at high risk or low risk for exacerbation. The assignment of high risk and low risk reduced the burden on the staff in implementing all of the aspects of HF disease management for all residents with HF and focused the interventions on those at greatest risk. In addition to a standing order, development of a process to manage information on each HF patient to improve HF care coordination in the SNF is essential. At a minimum, the document to coordinate care needs should include LVEF, weight goals, vital signs (including orthostatic blood pressures), HF medications, medications to avoid (eg, nonsteroidal anti-inflammatory drugs), and a mechanism to document resident and family HF education. The healthcare provider managing the resident in the SNF should document HF diagnosis, LVEF, and pathogenesis.

Traditionally in SNFs, CNAs are the staff members at the bedside the majority of the time and are integral to detect changes in condition. Unlicensed CNA staff must work closely with the licensed staff (RN and LPN) to report changes in condition so that licensed staff assesses jugular venous distention, edema, and lung sounds. Jugular venous distention is the most important examination for volume status (Figure).[87] Appendix 3 provides a detailed description of jugular venous pressure assessment. To support quality of care, all licensed staff must be educated on jugular venous distention measurement and the need to adjust the distance added based on patient position, because the distance between the sternal angle and the right atrium may change with patient position.[88,89] In addition to needing advanced training in fluid volume assessments, all licensed nursing staff require education about HF medications, assessment of HF exacerbations, and when to notify the physician or other care provider (eg, nurse practitioner or physician assistant) regarding changes in condition or weight.

The frequency of assessments of weight, signs and symptoms, fluid management, and vital signs has not been standardized in SNFs, and these assessments are primarily delegated to the CNA. Patients with rehabilitation or uncertain goals at greater risk for exacerbation should adhere to guidelines applied to community-dwelling patients, including identification of patient's euvolemic weight and daily weight monitoring.[86,90] Long-term lower-risk SNF residents with HF might have weekly weight assessments. Regulatory agencies use weight gain as a sign of adequate nutrition, so an increase in weight in a SNF is traditionally viewed as a positive indicator of health. Therefore, having all personnel be knowledgeable about the diagnosis of HF is imperative so that weight gain, in conjunction with signs and symptoms of worsening HF, will trigger a warning about the potential for hypervolemia. A weight gain of 3 to 5 lb (1.36 to 2.27 kg) over 3 to 5 days should alert licensed staff to perform an advanced assessment of volume status, vital signs and oxygen saturation, and notification to the appropriate provider managing the HF if fluid volume overload is confirmed.[86,90]

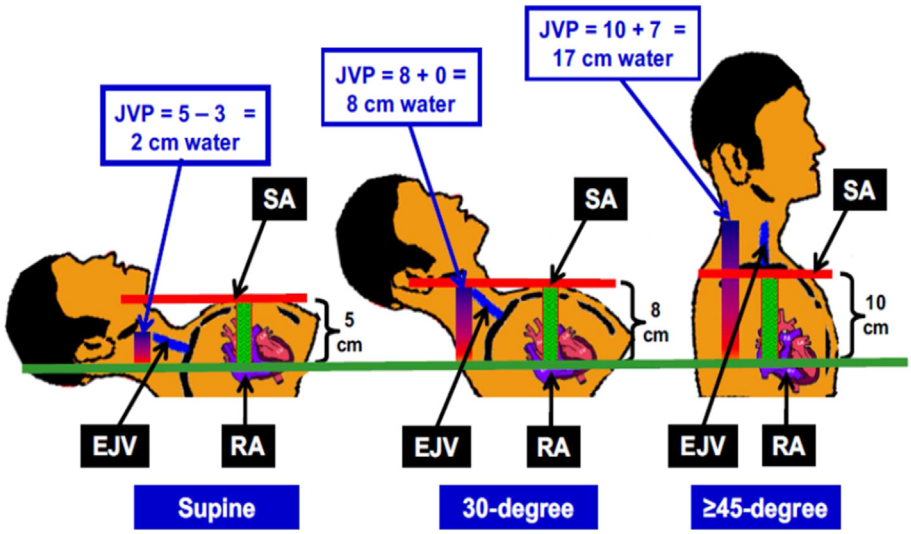

Figure. Estimation of jugular venous pressure in different positions. EJV, external jugular vein; JVP, jugular venous pressure; RA, right atrium; SA, sternal angle. Reprinted from Ahmed et al[87] with permission from American Medical Directors Association. Copyright © 2008, American Medical Directors Association.

Challenges of HF Management in SNFs

The complexity of an older population coupled with multiple comorbid illnesses presents ongoing challenges for both licensed and unlicensed nursing staff, who are the primary providers of day-to-day care. Nurses in SNFs report missing important changes in residents' conditions because of large workloads and reliance on assessments by unlicensed staff at the bedside.[85,91] Frail and cognitively impaired SNF residents with HF require a higher degree of vigilance in assessing subtle changes in condition than those with other diagnoses. The extra nursing observation needed provides a challenge to SNF staff who may lack skill in managing these complex residents. Another barrier in providing HF management in SNFs is inadequate communication between hospital staff and SNF staff.[85] Direct communication from hospital staff to the SNF staff specifically identifying HF management and goals may help to reconcile HF care.[92]

Recommendations for increasing nursing home staff, improving staff training, and enhancing compensation to improve the quality of care have been well articulated.[29,30] The SNF environment is challenged by a high rate of staff turnover[93] and low educational levels of staff. More research is needed to understand the implications of the number and type of nursing staff in SNFs as well as the characteristics of SNF residents in relation to HF management and patient outcomes.[94]

Recommendations

1. **An HF diagnosis should be established at SNF admission. Potential risks for HF exacerbation should be identified *(Class I; Level of Evidence C).***
2. **Coordination of documented HF information (LVEF, medications, renal function, serum electrolytes, and weight goals) should be documented at admission *(Class I; Level of Evidence C).***
3. **Residents with HF should receive frequency of weight assessments, vital signs, nursing assessment of signs and symptoms, and education consistent with HF guidelines and goals of care *(Class I; Level of Evidence C).***

Dietary Recommendations

Sodium and Fluid

Sodium balance is a critical component in the propagation of the HF syndrome and in the therapeutic treatment of HF.[95] Restriction of dietary sodium can significantly reduce edema and fatigue, decrease extracellular water, reduce risk of rehospitalization, and improve quality of life.[96–98] Dietary sodium intake recommendations were softened in the "2013 ACCF/AHA Guideline for the Management of Heart Failure"[46]; however, it is reasonable for patients with symptomatic HF to restrict dietary sodium, and in some cases fluid, to reduce congestive symptoms.[45,46,98,99] No studies specifically address dietary recommendations for patients in SNFs. Most SNF kitchens do not offer a low or 2-g sodium diet. Nonetheless, moderate sodium restriction of <3 g/d is preferable to avoid a rapid increase in extracellular volume and exacerbation of HF.[45,100] Restriction of sodium (<3 g/d) may be considered in patients with severe HF whose symptoms are not adequately controlled with medications and less stringent sodium restriction.[45,46,101]

A reduced sodium diet should be available in SNF facilities through use of fresh foods and low-sodium products, for resident comfort and avoidable hospital readmissions. Evidence suggests that preparing low-sodium meals and allowing patients to add salt to taste at the table will result in lower total sodium intake while maintaining flavor. Salt added to the surface of food provides more salt taste than when added while cooking and results in greater patient satisfaction with meals than preparing 3-g sodium meals and removing access to a salt shaker.[102] Staff and family education is paramount to successful dietary adherence by residents through reinforcement of HF education.[103]

There is no definitive evidence that fluid restriction is beneficial for patients with compensated HF.[95] Concern for bowel management must be addressed by staff when patient's fluids are restricted. This is particularly important when certain bulk laxatives are administered with inadequate fluid, because this can exacerbate rather than relieve constipation.

Other Nutrition Considerations

Energy and Protein. HF is associated with an elevated resting metabolic rate and catabolic/anabolic imbalance.[104] Patients with HF require an additional 3 to 7 kcals/kg/day more than healthy adults and may require $\approx$20% more protein than healthy adults to meet metabolic demands (minimum 1 g/kg).[105]

Vitamins and Minerals. Water-soluble vitamins, particularly thiamine, may be hypersecreted with the use of loop diuretic agents, which increases the risk for deficiencies.[106] Up to 90% of older adults have inadequate dietary vitamin D and E intake,[107] and 80% of the bioactive (1,25-dihydroxy) vitamin D required is synthesized in the skin. Therefore, vitamin D deficiency may be particularly problematic in SNFs.[108] Vitamin D deficiency is associated with decreased functional capacity,[109] increased renin-angiotensin system activity, inflammation, and ventricular hypertrophy, all of which exacerbate HF.[108,110] Vitamin E deficiencies result in reduced antioxidant capacity, which can lead to greater oxidative stress.[105] Common dietary deficiencies of the minerals calcium and magnesium, which are important in maintaining normal cardiac rhythm, are also worsened by loop diuretic agents.[107] Daily multivitamin and mineral supplementation to prevent deficiencies may be considered for residents taking loop diuretic agents, as well as those with decreased intake or who lack a varied diet.[45,111] An additional calcium supplement may

be considered for residents who are not able to get adequate calcium from their diet.

Nutrition Assessment

Laboratory assessment of indicators of nutritional status can be expensive, and anthropometric indicators require specialized training to obtain reliable measures.[112] Body weight tracked over time can provide an easily obtainable indicator of nutritional status. Body weight loss of >6% of previous stable weight over 6 months (without evidence of fluid retention) is associated with shorter survival and has been used as a definition of cardiac cachexia.[113] This relationship holds true for residents who are overweight and obese.

Recommendations

1. **It is reasonable for patients with symptomatic HF to restrict dietary sodium. Restricting sodium and permitting a salt shaker at the table is suggested *(Class IIa; Level of Evidence C).***
2. **Individualized fluid restriction of 1.5 to 2 L is reasonable to improve symptoms for residents with hyponatremia or fluid retention in stage D HF *(Class IIa; Level of Evidence C).***
3. **Daily vitamin and mineral supplementation may be beneficial for those with established deficiencies and unable to consume a varied diet *(Class IIa; Level of Evidence C).***
4. **Body weight should be tracked over months to identify clinically significant weight loss not related to volume status *(Class I; Level of Evidence C).***

Exercise Recommendations

Effects of HF on Functional Capacity

Functional capacity is dictated by the ability to perform physical activities that require a certain level of aerobic capacity or skeletal muscle strength and endurance. The substantial decline in functional capacity is one of the primary and most debilitating consequences of HF. Cardiac function and skeletal[114–117] and respiratory[118–120] myopathy all contribute to fatigue and decreased physical exertion capabilities in the HF population. This is particularly relevant to frail HF patients, in whom functional disability is likely to be advanced. Literature supporting rehabilitation to improve functional capacity has traditionally focused on young, predominantly male patients with HF*r*EF; however, similar benefits have been observed in elderly patients,[121–125] females,[124,126–128] and those with HF*p*EF.[129,130]

Aerobic Exercise Training

Numerous original investigations, which have been collectively analyzed and summarized by meta-analyses,[131–134] scientific statements,[135] and review articles,[136,137] elucidate the benefits of aerobic exercise training in HF patients, including significant improvement in aerobic functional capacity and quality of life.[131,133] Some evidence suggests a reduction in morbidity and mortality in patients with HF who participate in aerobic exercise training, yet this was not demonstrated in the Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION) trial, performed in outpatients with HF*r*EF.[138]

The majority of investigations documenting the benefits of aerobic exercise in patients with HF used lower training volumes than that recommended for adults (ie, 150 minutes of moderate-intensity exercise or 75 minutes of high-intensity exercise per week).[139] The fact that significant benefits from aerobic exercise training can be obtained without meeting current optimal recommendations may be particularly important for HF patients in SNFs.

The general principles of aerobic exercise training apply to all clinically stable HF patients, including those in SNFs. The mode of exercise should incorporate large muscle groups in a rhythmic manner. Hallway ambulation or lower extremity cycle ergometry are both low-cost training options that can be easily implemented in this setting. Cycle ergometry, particularly through a recumbent unit, may be particularly advantageous for patients with balance deficits and increased fall risk during ambulation. In SNFs, physical therapy is delivered 5 or 6 days per week on Medicare-certified units and usually 3 days per week for specific brief periods on long-term care units and generally includes a mix of balance or strengthening and aerobic exercise. For HF patients in a SNF, a light to moderate aerobic training intensity is reasonable. The rating of perceived exertion scale is an accepted method of gauging aerobic exercise intensity and is a more feasible approach in this setting. Patients should rate their level of exertion between 10 and 13 (light to moderate) on a 20-point Borg scale.[140] In a randomized controlled setting of exercise training in HF patients, arrhythmias were not significantly higher in the training group than in a nonexercising control group.[138] If possible, it may be advantageous to conduct group aerobic exercise sessions as a means to improve patient enjoyment and compliance and reduce staff burden.

Resistance Training

Significant reductions in skeletal muscle strength/endurance are present in HF and profoundly compound the decline in functional capacity.[141–143] Resistance training in stable HF patients results in significant improvements in muscle strength and endurance, an outcome not realized by participation in aerobic exercise training alone.[137,144,145] Striking increases in strength of 100% to 200% have been shown after resistance training in residents of SNFs in their 80s and 90s, which allows some to reduce their dependence on walking aids.[146] Moreover, the combination of aerobic and resistance training safely improves a broader spectrum of physiological facets that contribute to reductions in functional capacity in patients with HF.[147,148]

HF patients participating in resistance training in a SNF should follow a low-intensity, high-repetition paradigm.[137,149] The intensity should generally be between 50% to 70% of 1-repetition maximum (ie, the highest amount of weight that can be lifted 1 time for a given movement using good form). This level of resistance typically corresponds to the ability to perform 10 to 15 repetitions with good technique. Patients should ideally perform 4 to 6 exercises involving the major muscle groups of the upper and lower extremities, 1 to 2 sets per exercise, 2 times per week.[137,145]

Although not a traditional approach to resistance training, tai chi, although seemingly not effective in improving submaximal aerobic performance (ie, 6-minute walk test distance) or peak oxygen consumption, appears to improve muscle strength and quality of life.[150−152] Future work is needed, however, to better determine the benefits of alternative rehabilitation approaches, such as tai chi, on muscle strength and endurance in patients with HF.

Inspiratory Muscle Training

Inspiratory muscle weakness is common in HF patients[119,120,153] and is significantly associated with a lower aerobic capacity.[119,153,154] Inspiratory muscle training (IMT) significantly improves inspiratory muscle strength and endurance, aerobic exercise capacity, submaximal aerobic exercise tolerance, quality of life, and perceived exertional dyspnea in patients with HF.[155−157] In addition, the combination of IMT and traditional aerobic exercise training results in a significantly greater improvement in aerobic capacity than aerobic exercise training in isolation.[158] Lastly, IMT appears to have a minimal adverse event risk in older patients potentially in a less than optimally stable medical status (ie, those in an intensive care unit or with left ventricular assist device implantation).[157,159,160]

To determine appropriateness for IMT, assessment of static maximal inspiratory pressure may be considered. Normative values for static maximal inspiratory pressure according to age and sex are available for comparison.[161] For patients with a low predicted maximal inspiratory pressure (≤70%), IMT may prove beneficial, and it can thus be considered in patients with HF who fall below this threshold. IMT is implemented with a handheld device in a manner similar to aerobic exercise prescription with respect to frequency and duration. General IMT guidelines include the following: (1) training most if not all days of the week; (2) ≈30 minutes' duration per session, (3) training intensity should be at least 30% of static maximal inspiratory pressure; and (4) training respiratory rate should be set between 15 and 20 diaphragmatic breaths per minute. When deemed appropriate, IMT can easily be implemented. Although IMT is presently not routinely provided in SNFs, the cost of an IMT device is reasonable ($8−$25 per unit), and once trained, the patient can conduct the protocol independently without monitoring. Training to assess inspiratory muscle strength and deliver IMT interventions can be obtained through one's professional academic training, postgraduate continuing education, or an in-service program within the SNF. Nonphysician health professionals such as nurses and physical and occupational therapists are examples of practitioners who can assess inspiratory muscle strength and subsequently prescribe and supervise IMT.

Functional Neuromuscular Electronic Stimulation

Neuromuscular electrical stimulation (NMES) is a noninvasive technique (ie, surface electrodes) that specially targets major muscle groups of the lower extremities, which significantly contribute to functional deficits in the HF population.[114] Physical therapists receive training on the use of NMES during their professional education and must demonstrate competency. The NMES unit is a handheld device that is oftentimes readily available to physical therapists. The use of NMES may be particularly advantageous in patients with advanced HF who have a limited ability to participate in a traditional exercise training program (ie, NYHA functional class III to IV).[162] In fact, the benefits derived from NMES appear to be greater as HF severity progresses.[163] Similar to IMT, NMES presently is not routinely provided in SNFs, but this intervention could be added without significant effort or expense.

The use of NMES in patients with HF is summarized in several meta-analyses and review articles,[155,163−165] which demonstrate improved aerobic capacity, submaximal aerobic exercise tolerance, skeletal muscle strength/endurance, and perceived quality of life. Although additional research in this area is needed, there appears to be sufficient evidence to warrant clinical consideration of NMES, particularly in those patients who have limited ability to participate in conventional exercise training.

SNF Personnel Administering the Rehabilitation Program

In Medicare units, therapy must be developed by a physical therapist and ordered by the physician or nurse practitioner. Many SNFs use therapy aides or assistants to deliver the therapy.

Recommendations

1. **An individualized continuum of rehabilitation services (ranging from subacute rehabilitation to restorative care) based on patient preferences and level of care should be implemented because it is an integral component of the treatment plan for patients with HF, including those residing in a SNF *(Class I; Level of Evidence A).***
2. **It is reasonable to prescribe both aerobic and resistance training program for all HF patients who are**

clinically stable, willing, and capable *(Class IIb; Level of Evidence A).*

3. **For those patients identified to have inspiratory muscle weakness, implementation of IMT can be considered *(Class IIa; Level of Evidence B).***
4. **For patients with advanced HF severity and unable to participate in traditional rehabilitation in a meaningful way, NMES can be considered provided it is consistent with their goals and cognitive and physical function *(Class IIa; Level of Evidence B).***

Management of Cardiac Implantable Electronic Devices in HF Patients in SNFs

As the population ages and the indications for implantable cardioverter-defibrillator (ICD) therapy and other cardiac implantable electronic devices (CIEDs) increase (Table 6),[166–171] the numbers of patients entering SNFs with these devices will grow. Identification of the presence of a CIED is the first step in management. SNF intake forms should include history of ICD or pacemaker implantation, as well as identification of the generator on the physical examination. The patient's wishes for his or her ICD should be addressed as part of the routine discussion of goals of care and resuscitation status. Many will choose to keep the device active[167,171–174]; however, it is appropriate to identify a future time when deactivation would be desired. Staff should identify the cardiology team managing the device.

Recommendations

1. **SNF intake history and physical examinations should include evaluation for the healthcare provider's presence of a CIED *(Class I; Level of Evidence C).***
2. **For those with an ICD identified, discussion should take place regarding each resident's wishes for deactivation or continued activation. This should be done in consultation with an attending cardiologist who can evaluate and explain potential implications of deactivation *(Class I; Level of Evidence C).***

Monitoring of CIEDs

For those who desire continued therapies, appropriate monitoring for follow-up of the device should be performed in SNFs. The current recommended minimum frequency of monitoring for patients with CIEDs is once per year in-person. In addition to interrogation of the device, annual in-person monitoring permits an updating of the medical history and cardiovascular physical assessment. For those who are medically stable with no anticipated programming needs, additional monitoring can be conducted remotely (or in-person) every 3 to 6 months for an ICD and every 3 to 12 months for a pacemaker.[175]

Recommendations

1. **Monitoring should follow established guidelines[175] with follow-up once per year in the healthcare provider's office and every 3 to 6 (ICD) or 3 to 12 (pacemaker) months either remotely or in the office *(Class I; Level of Evidence B).***
2. **Use of remote monitoring for those in SNFs is reasonable and may facilitate appropriate follow-up *(Class IIa; Level of Evidence B).***
3. **Coordination of physicians, including a cardiologist when appropriate, involved in patient care is imperative for remote monitoring to be effective *(Class I; Level of Evidence C).***

Evaluation of the Resident With HF for Device Consideration

Many subgroups of patients with HF benefit from implantation of an ICD for primary or secondary prevention

Table 6. Summary of Cardiac Implantable Electronic Devices

Device	Purpose	Functions	Special Considerations Related to SNF Residents
Pacemaker	Treatment of bradycardia	Provides pacing to atrium and/or ventricle; can be dual chamber or single chamber	
ICD	Treatment of sudden cardiac arrest	Delivers shock (+/− antitachycardia pacing) to convert ventricular fibrillation/ tachycardia; can be dual chamber or single chamber; all ICDs contain pacing capability	Discuss patient wishes, goals of care, resuscitation and deactivation preferences[167–171]
CRT-P	Restores LV synchrony in patients with abnormal ventricular conduction to improve HF	Paces RV, through standard RV intracavitary lead, and LV, through lead positioned via coronary sinus venous system to epicardial surface LV, as well as right atrium	
CRT-D	Treats both HF and sudden cardiac arrest	Includes all functions of defibrillator and CRT device	Discuss patient preferences, goals of care, resuscitation and deactivation preferences[167–171]

CRT, cardiac resynchronization therapy; CRT-D, CRT with defibrillation; CRT-P, CRT—pacing only; HF, heart failure; ICD, implantable cardioverter-defibrillator; LV, left ventricle; RV, right ventricle; SNF, skilled nursing facility.

of sudden cardiac death. The decision regarding device implantation for residents in SNFs should focus on the resident's goals of care, which may include prolongation of life, improvement of symptoms, or comfort with avoidance of aggressive therapy. Patients with HF*r*EF, left bundle-branch block, QRS duration >150 ms, and NYHA functional class II to IV HF benefit from cardiac resynchronization therapy (CRT) in respect to mortality and hospitalization,[176–179] functional class, exercise capacity, and quality of life.[176,180,181] The benefits of CRT have been most clearly demonstrated in patients with left bundle-branch block and sinus rhythm.[180] Should medical therapy (eg, digoxin) fail to improve symptoms, resynchronization therapy delivered in a pacing-only device without defibrillation capacity may be appropriate for symptom relief without the possibility of defibrillator shocks.[177] In patients with limited prognosis because of advanced HF or serious comorbidities, ICDs should not be implanted, because no survival benefit was observed from ICD implantation until after the first year in 2 of the major trials.[182,183]

Discussions concerning the initial implantation of an ICD or CRT device should follow patient-centered, shared decision-making models.[184] Especially in older people and those in SNFs, determination of CIED benefits should include consideration of comorbidities. Discussion of device implantation should focus on overall goals of care for a patient's remaining years.

Recommendation

1. **Determination of ICD or CRT benefits should include consideration of comorbidities and prognosis, and discussion of ICD or CRT implantation should focus on overall goals of care *(Class I; Level of Evidence B).***

Communication: Discussion of the ICD in the Context of Goals of Care

CIEDs may result in improvements in quantity or quality of life or both. Timely and effective communication among patients, families, and healthcare providers is essential to ensure informed consent and prevention of unwanted shocks at the end of life. Twenty percent of patients may receive shocks from their ICDs at the end of life, to the distress of both the patients and their families.[169] Shocks have been described as "blow to the chest, being kicked by a mule,"[185] and thus, it is not surprising that the pain, anxiety, and fear that occur with or in anticipation of shocks can decrease the quality of life.[186,187] All ICDs can be deactivated by placing a doughnut magnet directly over the device. The Heart Rhythm Society published recommendations regarding CIED decision making and deactivation.[188] As recommended for hospices,[189] SNF policies should include a discussion of patient wishes after identification of an ICD.

Logistics of CIED Deactivation

When a decision for deactivation has been made, the Heart Rhythm Society recommends a series of procedures that should be consistently applied. See Appendix 4 for specific recommendations.[188] The defibrillator function on all ICDs can be deactivated by placing a doughnut magnet directly over the device. Pacing function will not be disabled by placing a magnet over the device. Pacing response to magnet application in defibrillators varies with the device. Because devices differ in response when the magnet is removed, the magnet should be left in place until magnet function is confirmed and/or a programmer is available. All SNFs should have doughnut magnets on-site and readily available.

Recommendations

1. **Communication regarding deactivation preferences should be proactive, and this issue should be readdressed in an ongoing manner as a resident's course progresses, preferably in consultation with the attending cardiologist *(Class I; Level of Evidence C).***
2. **SNFs should have a deactivation policy and processes in place that include magnet placement if needed *(Class I; Level of Evidence C).***
3. **SNFs should have doughnut magnets on-site available for emergency deactivation if needed. Staff should be instructed in location and use of magnets *(Class I; Level of Evidence C).***

Deactivation of Pacemakers

Although pacemakers do not actively impair quality of life and do not prolong the dying process, patients may determine that the device benefits no longer outweigh its burdens. Consequently, patients may request deactivation of a pacemaker or the bradycardia-pacing functions of an ICD. Some have debated whether there are moral or philosophical distinctions between pacemaker and ICD deactivation,[190–192] particularly in a pacemaker-dependent patient. Ethically and legally, patients have the same right to deactivate a pacemaker as any other life-sustaining therapies.[188] Appropriate communication regarding the benefit and burden of continuing versus discontinuing pacing therapy is imperative, as is confirmation of understanding of the consequences of deactivation.

Transitions in Care

Transitional care requires a set of actions designed to ensure the continuity of patient care. A comprehensive and coordinated transition for patients with HF includes the patient's clinical status, anticipated clinical changes during the transitional period, and goals for medical management. Additional important aspects include logistical arrangements, patient and family goals and preferences,

Table 7. Components of HF Management Communications Between SNF and Hospital

Essential clinical data	Ejection fraction, NYHA functional class, echocardiogram, type of HF, HF pathogenesis
	Comorbid illnesses
	Vital signs
	Lab values (BUN, creatinine, potassium, sodium, hematocrit)
	Pertinent diagnostic tests
	Physical assessment (edema, JVP)
	Weight trajectory during hospitalization with indication of the patient's volume status and volume treatment
Important decisions/events made during the hospitalization	Response to therapy/lack of response
	Patient cognition: dementia/delirium
	Adverse events/adverse drug reactions
	Deviations from chronic home management
	Family/patient decisions on treatment plan
	Weight fluctuations and ideal weight goals
Plan of care for the first 30 d after hospitalization	Drug titration goals (document rationale if not on standard therapy)
	Target weight, heart rate, and blood pressure
	Who is managing HF (ie, cardiology follow-up, primary care, or SNF physician)
	Risk for rehospitalization
Patient/family discharge instructions	Knowledge and acceptance of plan
	HF education delivered
Medications	Guideline medications and/or doses (document rationale if not on guideline therapy)
	Medication sensitivities
	Response to diuretic agents (volume status)
	Adverse drug reactions, such as hyperkalemia from spironolactone
	Titration plan
Patient self-management capacity	Cognition, health literacy, depression, anxiety
	Potential discharge self-management competency
Family self-management support capacity	Family's understanding of plan of care and their involvement
	Potential discharge: family management competency
Follow-up appointment	Ensure that the staff is aware and ensure that the follow-up appointment is scheduled after discharge home

BUN, blood urea nitrogen; HF, heart failure; JVP, jugular venous pressure; NYHA, New York Heart Association; SNF, skilled nursing facility.
See Appendix 1 for an example of a transition form.

and educational needs.[193] Inadequate transitional care can lead to adverse events, increased costs, and increased length of stay.[85]

Transitions of care are optimized when clinicians prepare patients and their caregivers to receive care in the next setting and actively involve them in the formulation and execution of the transitional care plan.[92,193] For hospital and SNF staff, bidirectional communication is essential. This communication can be facilitated by both verbal and written methods. For written communication, traditional forms can be enhanced to include essential components of the HF management care plan (Table 7).

In addition to the hospital staff providing adequate information (listed in Table 7), it is imperative that the hospital discharging team ensure that the patient can be managed adequately in the SNF. The team needs to consider that SNFs have higher patient to staff ratios, fewer licensed nursing staff, and limited on-site healthcare provider availability. HF patients who are not stable or who need intensive monitoring during medication titration are not appropriate candidates for SNF care.

The transition of care principles listed above apply to the transition from SNF to home. Patients leaving the SNF should be discharged with a plan for ongoing HF management. This should include investigation of options for self-management (the patient himself/herself, a family member, other care providers) and possibly a referral to home health care. If a patient is being sent home with death expected in the next several months, hospice care may be appropriate. Bidirectional communication of the HF care plan needs to be communicated in written and verbal format between the SNF and home healthcare staff. This communication will contribute to a coordinated transition from SNF to home. A 7-day follow-up appointment with the patient's HF provider after SNF discharge is an important link back to the community.

The transition from the SNF back to the hospital is another area of transitions of care that must be considered. When a patient is being transferred back to the hospital, the same information in Table 7 must be communicated to the hospital staff. Resources are available on the Internet for staff in SNFs and long-term care facilities to assist with transitions and include the *Transitions of Care in the Long-Term Care Continuum,* created by the American Medical Directors Association (http://www.amda.com/tools/clinical/toccpg.pdf), and the INTERACT project (Interventions to Reduce Acute Care Transfers), a quality improvement program for long-term care staff that was developed by the faculty at the Florida Atlantic University. This clinical resource includes clinical and educational strategies to manage acute changes in patients' conditions and is available on the World Wide Web at http://interact2.net/tools.html.

Recommendations

1. **Bidirectional verbal and written communication between healthcare facilities and/or providers should include comprehensive clinical data, a description of the course of illness and treatment, goals of**

care, and plans for follow-up care as appropriate *(Class I; Level of Evidence C).*

2. **For patients being discharged to home, options for self-management should be assessed simultaneously with arrangements for appropriate follow-up care *(Class I; Level of Evidence C).***

HF Education for Patients and Caregivers During SNF Stay and at Discharge

The SNF provides an opportunity to educate patients and caregivers about self-management; however, this requires that SNF staff have the knowledge and tools to provide HF education.[9,194] Teaching HF self-management is an integral part of HF rehabilitation and successful transition to home. There is little research targeting education for HF self-management for patients (and their caregivers) in SNFs, but a wealth of information and guidelines for teaching HF patients self-management in the community and during home health care exists.[194–200] Teaching self-management for HF in SNFs should mirror other initiatives developed for the hospitalized patient when the SNF stay is an extension of the hospitalization episode.

Educational Considerations for the SNF Resident

When education materials and strategies are developed for patients in the SNF, the status of the patient (ie, fatigue, cognition, sensory impairment, and health literacy), caregiver involvement, and discharge destination all need to be considered. For cognitively intact patients receiving long-term care, educational priorities include timely reporting of changes in signs and symptoms to the nursing staff to facilitate early intervention for volume overload. For those planning on returning home, a first step is to identify the appropriate caregiver to participate in educational sessions. HF teaching should begin with determination of the patient's and caregiver's ability to learn and manage the HF regimen. Factors to be considered include cognitive impairment, health literacy, sensory impairment, and physical disabilities.

Cognitive impairment is present in 25% to 50% of HF patients, with deficits primarily in memory and executive function.[201] The Brief Interview for Mental Status score is a standard part of MDS 3.0 to measure cognitive impairment in SNFs. The Brief Interview for Mental Status is scored from 0 to 15; a score $\leq$12 indicates cognitive impairment, although this tool may miss significant executive dysfunction, a major component of cognitive impairment in HF patients. The Confusion Assessment Method, also included in the MDS 3.0, identifies the patient with delirium; however, there is evidence that the cognitive screening on the MDS has a ceiling effect and does not sufficiently discriminate among different cognition strata.[202] The Montreal Cognitive Assessment has been used to assess cognition in HF patients previously not suspected to have impairment. In a small study of older adults attending an outpatient HF clinic (n = 100, mean age 72 years [standard deviation, 10 years]), >70% scored below 26 on the Montreal Cognitive Assessment, which indicates at least mild cognitive impairment.[203] Sensory impairments (hearing, sight, tactile function) and physical impairments that affect ADLs also require consideration when HF self-management interventions are developed. A caregiver should be identified and taught how to provide or assist with care for a person with HF who has been identified as having either a cognitive or sensory impairment.

Health literacy of the patient and the caregiver is defined by the Institute of Medicine as the "degree to which a person can obtain, process, and understand basic health information and services needed to make appropriate health decisions."[204,205] Health literacy can be assessed with the Shortened Test of Functional Health Literacy in Adults.[204] The Shortened Test of Functional Health Literacy in Adults is a 36-item, 7-minute timed test of reading comprehension. For the HF patient, the time limits are not useful because they inaccurately categorize patients with low or marginal health literacy. Alternatively, a brief screening tool tested in 1547 HF outpatients asks 3 questions: (1) How often do you have someone help you read hospital materials? (2) How often do you have problems learning about your medical condition because of difficulty reading hospital materials? and (3) How confident are you filling out forms by yourself?[206] Questions are scored on a 5-point Likert scale, with higher scores indicating lower health literacy. Literacy is dichotomized with scores >10 indicating low health literacy and scores of $\leq$10 being deemed adequate. The 3-question tool is reportedly comparable to the Shortened Test of Functional Health Literacy in Adults and the Rapid Estimate of Adult Literacy in Medicine.[206]

HF Education Curriculum

A preset curriculum should be established by the facility for HF patients and included as part of an order set for every HF patient, based on the "State of the Science: Promoting Self-Care in Persons With Heart Failure: A Scientific Statement From the American Heart Association."[81] SNFs can partner with expert HF teams to develop patient education.

A multidisciplinary approach to HF education is outlined in Table 8. The incorporation of tools such as "HF zones" (Institute for Healthcare Improvement; http://www.ihi.org/resources/Pages/Tools/HeartFailureZoneFlyer.aspx) can "train" the patient to recognize signs and symptoms of HF and severity, as well as how to follow up in reaction to these prompts. Recognition of the early signs of impending HF decompensation is challenging for patients with HF. Commonly, older adults report waiting for HF symptoms to spontaneously get better. As a result, symptoms such as dyspnea on exertion, fatigue, and edema become increasingly severe over $\approx$1 week before hospitalization.[50] Therefore, teaching patients and families to assess and report symptoms is important. Symptoms should be assessed daily with activity versus at rest. Assessment includes comparing symptoms

Table 8. HF Educational Content

Teaching Objectives for Patients and Caregiver	Suggested Discipline(s) to Teach and Reinforce During Daily Activities	Examples of Teachable Moments in Care	Teaching Point for Patient	Demonstration of Understanding From Patient or Caregiver
Identification of signs and symptoms	Nurse; physical therapist	Exercising at physical therapy	These are the symptoms to look out for: increasing lower extremity or abdominal edema, decreased activity tolerance, shortness of breath, discomfort while lying flat	What type of symptoms did you experience today during rehabilitation? What position did you sleep in last night?
How to monitor weight and respond to changes	STNA, CNA, occupational therapist	While being weighed	It is important to weigh yourself on a daily basis to see if you are gaining fluid.	These are your weights over the past 5 days; what do they tell you? Have patient bring in home scale to practice during SNF care.
Dietary restriction of sodium	Dietary, STNA, CNA	Reviewing and ordering a meal Reading labels	Salt can cause you to retain fluid and cause HF to get out of control.	This is what we are serving today; which do you think is the better choice? Identification of high-sodium foods that are brought in by the family.
When to call the healthcare provider managing HF or 9-1-1	Nurse; physical and occupational therapists	Daily review of signs and symptoms	Some symptoms are warning signs that your HF is getting worse; it is important to notify your doctor so your symptoms get addressed before you need to go to the hospital.	You seem short of breath today; what would you do if you were at home with this symptom?
Managing medication, prescription and nonprescription	Nurse, pharmacist, or occupational therapist	Receiving medication	The diuretic pill is to remove water; the pill called enalapril is to lower your blood pressure and keep you from retaining fluid.	What do you do when you have only a few pills left in a bottle when you are at home?
Follow-up appointments	Social work	Review of discharge instructions	A recent hospitalization makes you vulnerable to repeat hospitalizations. It is important that you see your doctor soon after discharge so any symptoms or problems with your care plan can be discussed.	Which doctors/healthcare providers do you see frequently? Who follows your HF? When will you see your healthcare provider?
Activity	Physical therapist	Exercising at physical therapy	It is important to maintain your activity level so you don't become deconditioned. Weakness and deconditioning will put you at risk for falls and fractures.	Where can you walk when you are at home? Are there household chores that you can participate in?
Staying well: immunizations, alcohol intake, smoking cessation	Social worker, nurse	Review of discharge instructions	Illness, alcohol, and tobacco can worsen HF.	Did you receive any immunizations while you were here? Would you like to make a plan to quit smoking/drinking alcohol

CNA, certified nursing assistant; HF, heart failure; SNF, skilled nursing facility; STNA, state-tested nursing assistant.

with those experienced the prior day (same, better, or worse). Practicing this skill on a daily basis while still in the SNF will help the patient apply these behaviors at home.

Recommendations

1. **Assessment by healthcare providers of resident and family capacity to perform HF self-care includes identifying physical and cognitive dysfunction, sensory impairments, health literacy, and psychosocial support. Educational interventions to support self-care should be based on this assessment of self-care capacity and caregiver support with appropriate care coordination and active follow-up after discharge *(Class I; Level of Evidence C).***

2. **Healthcare providers should instruct patients and caregivers to assess symptoms with activity (versus rest) and compare symptom burden with that experienced the prior day. Emphasize the importance of reporting a change in symptom status to the healthcare provider to avert hospitalization for symptom management *(Class I; Level of Evidence C).***

HF Education for SNF Staff

Education of SNF staff should include basic training for nursing assistants and more advanced training for LPNs and RNs, nurse practitioners, physicians, and other professional staff. Typically, each SNF has its own education development staff member who is responsible for staff education programs. Experts from hospital-based HF teams can partner with SNF educators to create educational programs.

Education of staff in a SNF needs to occur at different times. Initially, all staff need to be educated on the basics of HF management; this could include mandatory face-to-face didactic sessions or World Wide Web–based modules such as the HF physiology and management modules provided by the National Heart Failure Training Program (http://www.nheft.org). Education by either face-to-face or World Wide Web–based modules increases staff knowledge and confidence in HF management.[9] Ideally, education of SNF staff will include HF management basics for new staff and ongoing advanced training reinforcement for other staff. Use of simulation case studies and teaching during multidisciplinary patient rounds are ways to strengthen assessments and critical thinking skills. After all educational programs, evaluation of learning ensures that knowledge and skill were transferred. A 20-item valid and reliable survey, based on evidenced-based guidelines, is available to assess knowledge in 5 educational areas.[207,208] Educational resources also are available on the websites of the AHA, Heart Failure Society of America, and the American Association of Heart Failure Nurses.

Content of HF Management for Staff Education

There is a general lack of knowledge among clinicians regarding care of the patient with HF. Table 9 displays the content of HF education in relation to the level of the learner. Studies of hospital and home care nurses have found that nurses need more education specifically related to nonsteroidal anti-inflammatory drugs, use of potassium-based salt substitutes, and when to call the healthcare provider.[208,209]

Other options for HF education in SNFs include specialized education or HF certification for a staff nurse practitioner or nurse to create a local expert. Alternatively, consultative relationships with HF specialist clinicians for input on the complexities of managing comorbidities and medication interactions can be developed. To reduce rehospitalization, procedures and policies in SNFs are needed for managing patients with HF.

Recommendations

1. **Staff education on HF monitoring and management should be provided regularly and tailored to all levels of healthcare providers (CNA, RN, nurse practitioner, medical doctor, physical therapist) *(Class I; Level of Evidence C).***
2. **Educational content should include tools for monitoring HF-related symptoms (including impact on well-being and psychosocial health), HF-related medications, medications to avoid (eg, nonsteroidal anti-inflammatory drugs), signs and symptoms of decompensation, and when to call the healthcare provider for escalating symptoms *(Class I; Level of Evidence C).***

End-of-Life Care

End-of-life care is increasingly provided in SNFs, either with the Medicare hospice benefit or not. Hospice care can be provided to patients in SNFs when the room-and-board costs are paid by someone other than Medicare (commonly private pay or Medicaid). Hospices also contract to provide "general inpatient care" in SNFs for short-term intensive hospice care under the hospice benefit.

Between 2.5% and 30% of SNF residents receive either hospice care or designated palliative care.[21] However, no data identify the proportion of SNF residents with HF receiving 1 of these services. When the end of life is anticipated, the structure of care ideally includes patient privacy, family support, and access to both the patient's usual clinicians and palliative care clinicians.[210] Palliative care clinicians are not commonly available in SNFs, except through hospice care. However, many SNFs have developed "palliative" or "hospice" units, often in collaboration with hospice agencies.

Difficulty in identifying the end of life in HF patients has been well described,[211–213] despite the development of many risk scores and calculators.[214–216] The end-of-life course for frail elders with HF may be slow and characterized by poor physical function for a duration of 1 to 2 years.[217] Most patients with evidence-based HF care do not die a congested death and are more likely to die of metabolic or renal demise with subsequent coma or sudden death.[218,219] Avoiding congestion requires that care providers in SNFs understand HF volume assessment and management.

The cornerstones of quality end-of-life care are communication and shared decision making with the patient and family to facilitate recognition of and planning for death. Symptoms should be managed to maintain comfort. It is important to acknowledge the unpredictable

Table 9. Content of HF Education for SNF Staff

Topic	Level of Learner	Content
Physiology of HF	Basic	Circulation and heart as a pump; fluid overload
	Advanced	Pulmonary, cardiovascular, and renal systems
Knowledge of common HF medications	Advanced	ACEI/ARB, β-blocker, mineralocorticoid receptor antagonist, diuretic, digoxin, aspirin/warfarin
Signs and symptoms of fluid retention	Basic and advanced	Any degree of edema Abnormal lung sounds Cough, especially when laying down Dyspnea, orthopnea, paroxysmal nocturnal dyspnea Jugular vein distension Sleep disturbances Poor appetite Nocturia Fatigue
Signs and symptoms of decreased cardiac output	Advanced	Decreased circulation to extremities, abdomen, kidneys, heart, or brain Complications: PVD, GI symptoms, kidney insufficient, MI, TIA, CVA
Precipitants of HF	Advanced	Infection, arrhythmias, metabolic disturbances
Knowledge of implantable devices: pacemakers, cardiac resynchronization therapy, ICDs	Advanced	Purpose of device Identification of problems with device Turning off the device
Laboratory tests	Basic and advanced	List significant laboratory tests
Proper weighing procedures	Basic	Weigh at same time each day Have patient void before weighing Same clothes Same type of weight (standing verses wheelchair) If using wheelchair, ensure same chair each weight
Discharge plan and education	Advanced	Refer to education section
When to notify the nurse in charge	Basic	Weight gain, edema, shortness of breath, change in condition or vital signs
When to call the healthcare provider	Advanced	Bulging neck veins, lower extremity/sacral edema; respiratory effort with auscultation of anterior and posterior lungs breath sounds; provide blood pressure, pulse, respiration rate, pulse oximetry, and weight trends to healthcare provider

ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; CVA, cerebrovascular accident; GI, gastrointestinal; HF, heart failure; ICDs, implantable cardioverter-defibrillators; MI, myocardial infarction; PVD, peripheral vascular disease; SNF, skilled nursing facility; TIA, transient ischemic attack.

course of HF and inevitable death when advance care preferences are discussed at admission to a SNF and at turning points in the individual patient's course.[213] Transportable ''physician (or medical) orders for life-sustaining treatment'' (http://www.ohsu.edu/polst) are authorized in 23 states and have become the standard of care in SNFs. These forms identify preferences for approach to treatment, including whether the patient should be transferred to the hospital and whether there should be an attempt at resuscitation versus allowing natural death. In states with physician (or medical) orders for life-sustaining treatment, social work or nursing staff often complete the order form with the patient or family in the SNF and present it to the physician for signature. The physician should review preferences with the patient or family. For patients with defibrillators, preferences regarding deactivation should be part of the advance care planning discussion.

Treatment of volume overload can improve function, even toward the end of life. Overall, patient function and comorbidities may dictate that the focus of care be palliative, yet HF medications and volume management are appropriate until medications are limited by decreased oral intake, inability to swallow medication, or hypotension. There are no data regarding the appropriate withdrawal of medications for patients with HF nearing the end of life; however, maintenance of volume status close to euvolemia and continuation of therapies that address the neurohormonal alterations of HF (such as ACEIs and β-blockers in HF*r*EF) palliate HF symptoms.[212,220–222] All treatments ordered early in HF should be reevaluated in light of goals of care, particularly when patients or their surrogates have chosen to avoid hospitalization.

Common symptoms in patients with HF throughout the course of HF illness include breathlessness, pain, fatigue, and weakness.[217,223] HF symptoms should be assessed and managed throughout the course of HF (nonhospice palliative care), as well as at the end of life. Management of these symptoms is largely based on data for symptom management in HF patients who are not at the end of life. Small studies found that opioids are safe and effective for treatment of dyspnea in advanced HF patients[224] and reduce dyspnea and fatigue in patients with NYHA functional class II HF.[225] Paroxetine is effective for management of depression.[226] Thigh muscle strengthening is effective at reducing dyspnea and fatigue.[227] Most important to management of symptoms is regular assessment, ideally by patient rating. Ergoreflex activation in HF causes tachypnea, and periodic breathing with cyclic tachypnea is common, so observation of the patient alone is inadequate for dyspnea assessment.[228] Patients should be asked about

pain, anxiety, depressive symptoms, and fatigue in addition to dyspnea.

Hospice Comanagement in the SNF

A growing industry of hospice management in SNFs via contractual relationships between ≥1 agencies and the SNF has both improved end-of-life care and added some complexity. SNF residents receiving hospice care receive care from 2 layers of clinicians: the SNF staff and the hospice staff. Hospice teams may provide support to patients, their families, and SNF staff at the end of life but often lack expertise in HF care.[229] In the absence of hospice care, most SNFs lack organized end-of-life care and training in palliative care. CNAs are less likely than licensed staff to have training or experience in end-of-life care. High staff turnover in SNFs compounds the challenge of providing education in both HF care and end-of-life care to staff. Staff may especially require bereavement support,[230] particularly for long-term SNF residents with whom staff have developed relationships.

Regulation of SNFs emphasizes restoration and maintenance of function, and thus, a clear plan for palliation and allowing natural death must be documented for the facility to comply with state and federal regulations, especially if hospice is not involved. Medicare regulations prohibit enrollment in the Medicare hospice benefit while the patient is receiving Medicare payment for the SNF stay.[231,232] Thus, the patient must be in a non−Medicare-reimbursed bed (usually private pay) to receive the hospice benefit in a SNF. Medicare reimbursement differs for these services, with SNF care at a higher level than the hospice benefit. Lastly, plans made with the patient and family should include how and where to manage death, as well as plans for after-death disposition of the body and memorials.

Recommendations

1. **Discussions about goals of care and preferences for end-of-life care should be included in advance care planning at the time of admission to the SNF and whenever there is a change in health status and level of care *(Class I; Level of Evidence C).***
2. **HF symptoms should be assessed and managed throughout the course of HF to the end of life in accordance with informed patient/family preferences and goals of care *(Class I; Level of Evidence C).***
3. **At the end of life, continuation of HF*r*EF medications for HF*r*EF patients and volume management for all HF patients is recommended until medications are limited by decreased oral intake, inability to swallow medication, or hypotension *(Class I; Level of Evidence C).***
4. **For patients with devices, preferences regarding deactivation should be part of the advance care planning discussion. Patient preferences should be informed on the basis of prior consultation with a cardiologist who can educate the patient/family about the device and answer questions *(Class I; Level of Evidence C).***

Quality Outcomes

Quality Measures and the Application of Measures

Providing effective, timely, safe, equitable, efficient, and patient-centered medical care is an important goal. For patients with HF, there is a well-delineated evidence base of efficacious interventions to reduce mortality and hospitalizations, as well as to improve quality of life.[233] These include (1) specific evidence-based medical therapies (eg, ACEIs/ARBs, β-blockers, and mineralocorticoid receptor antagonists) provided to eligible patients, (2) select use of device therapies (eg, cardiac resynchronization devices, ICDs, and mechanical circulatory support devices) provided to eligible patients, and (3) use of multidisciplinary teams of providers to coordinate care and provide HF disease management.[233] However, studies have consistently shown gaps, variations, and disparities in the application of these evidence-based therapies in routine clinical practice.[234,235]

Quality measures are based on standards of care for a particular illness or condition that are designed to assess and subsequently improve the quality of medical care.[236] Quality measures are chosen on the basis of the knowledge or assumption that the particular care process is linked to improved patient outcomes. Quality measures provide clinicians with tools for measuring the quality of care and for identifying opportunities to improve.

The American College of Cardiology Foundation and the AHA have collaborated with the American Medical Association−Physician Consortium for Performance Improvement (AMA-PCPI) to develop sets of HF performance measures (first in 2005 and updated in 2011).[236,237] The purpose of these efforts is to provide process and outcome measures that can be used to improve care for patients with HF. The "ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure" measure set includes measures concerning the diagnosis, treatment, and outcomes of patients with HF. This updated measure set addresses both in-hospital care and continuing care in the outpatient setting. The measures included in this 2011 HF performance measure set are shown in Table 10.[237] These measures can be used internally within an organization to support quality improvement or publicly to compare the performance of providers, hospitals, outpatient care facilities, and healthcare organizations.

Table 10. ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With HF Set: Dimensions of Care Measures Matrix

Measure Name	Diagnostics	Patient Education	Treatment	Self-Management	Monitoring of Disease Status
1. LVEF assessment (outpatient setting)	✓				✓
2. LVEF assessment (inpatient setting)	✓				✓
3. Symptom and activity assessment					✓
4. Symptom management*			✓		✓
5. Patient self-care education*		✓		✓	
6. β-Blocker therapy for LVSD (outpatient and inpatient setting)			✓		
7. ACE inhibitor or ARB therapy for LVSD (outpatient and inpatient setting)			✓		
8. Counseling regarding ICD implantation for patients with LVSD on combination medical therapy*		✓			
9. Postdischarge appointment for HF patients					✓

ACCF, American College of Cardiology Foundation; ACE, angiotensin-converting enzyme; AHA, American Heart Association; AMA-PCPI, American Medical Association–Physician Consortium for Performance Improvement; ARB, angiotensin II receptor blocker; HF, heart failure; ICD, implantable cardioverter defibrillator; LVEF, left ventricular ejection fraction; LVSD, left ventricular systolic dysfunction.

*Test measures designated for use in internal quality improvement programs only. These measures are not appropriate for any other use, for example, pay for performance, physician ranking, or public reporting programs.

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Although these performance measures are applicable to HF patients in a SNF, it is important to recognize that most studies focused on younger HF outpatients in the home setting or hospitalized HF patients discharged to home. Much less is known about interventions to reduce mortality and hospitalizations and to improve quality of life among patients with HF who are discharged to SNFs.[234] Optimal measures of quality in the SNF have not been defined. Modification of existing measures and new quality measures specifically targeted for SNF residents will likely be required to improve care and outcomes for this high-risk patient population.[94]

Ideally, a set of quality measures for patients with HF in a SNF will include both measures of processes known to influence desirable outcomes for this patient population and measures of outcomes themselves. Desired outcomes for HF patients may include improved survival, reduced hospitalization, reduced readmission rates, reduced clinical deterioration, fewer symptoms of HF, improved activity level, improved patient self-management, and maintenance or improvement in level of independence.[94,233,236] However, for some HF patients in SNFs, palliation of symptoms and comfort care are the most desirable outcomes.

Frail elderly patients with HF, multiple comorbidities, and complex care needs require care coordination and disease management.[94,233,238] The hospitalization episode before discharge to a SNF provides an opportunity to improve care coordination and determine the therapeutic interventions that patients will need while residing in a SNF.[94] Determining the number and types of individualized interventions necessary while a patient resides at a SNF requires a comprehensive assessment of a patient's physical, cognitive, emotional, and social status before hospital discharge.[94,238] Prior studies have suggested that HF patients require a large number of individualized nursing interventions during hospitalization. The number and types of nursing interventions needed by patients with HF residing in a SNF continue to be high and complex. The most common reasons for rehospitalization among elderly Medicare beneficiaries with HF include not only worsened HF and electrolyte imbalances but also respiratory and urinary tract infections, sepsis, and altered mental status. Careful surveillance and early treatment of infections, electrolyte imbalances, and mental status disturbances together with monitoring for congestion should be priority interventions for HF patients residing in SNFs.[239,240] Quality measures that capture these domains of care should be considered for patients with HF in the SNF setting.

As HF patients become sicker, care may become more preference based. Decisions to balance palliative and disease-directed treatments may include withholding treatments of marginal potential efficacy, withdrawal decisions after treatments have been started, hospice referral for palliation, and determining whether end-of-life care will occur in the SNF or elsewhere. End-of-life care plan quality measures may be very important considerations for HF patients and potentially of value for improving patterns of care.[237] Quality measures that address the provision of palliative care and end-of-life care are applicable to eligible patients with end-stage HF. These include the AMA-PCPI and the National Committee for Quality Assurance's advance care planning measures set (Palliative Care Project on the AMA-PCPI website; http://www.ama-assn.org/ama1/pub/upload/mm/pcpi/geriatrics-ws.pdf) and an advance care plan measures set from the AMA-PCPI, American Geriatrics Society, and the National

Committee for Quality Assurance (Geriatrics Project on the AMA-PCPI website; www.polst.org).[237] These measures should be strongly considered for application in HF patients in SNFs.

In addition to measuring processes of care, measuring clinical outcomes also is important. Several relevant HF outcome measures in current use include 30-day mortality and 30-day readmission rates after an acute care hospitalization.[241,242] These measures at the hospital or system level incorporate risk-adjustment methodology to account for the often significant differences in patient populations across institutions.[243] However, to date, there are no outcome measures specific to HF patients in SNFs. These outcome measures would ideally include risk adjustment for multiple prognostic variables, including HF severity, comorbid conditions, frailty, and poor cognitive function. Such risk-standardized outcome measures will be needed to provide a more comprehensive view of care quality and SNF performance.[244,245]

Quality Improvement Methods

To address care quality for HF patients in SNFs will require dedicated quality assessment and improvement efforts. High-risk patients with HF have been shown to receive fewer life-prolonging therapies,[246] and patients discharged to SNFs were less likely to receive guideline-recommended therapies in the absence of contraindication or intolerance.[7] The simple dissemination of HF guidelines followed by written and verbal reminders about recommended actions has generally not been effective in improving the treatment of HF.[233,247] Dissemination of guidelines must be accompanied by more intensive educational and behavioral interventions to maximize the chances of improving care.[233] Chart audit and feedback of results, reminder systems to consider use of specific medicines or tests, use of clinical decision support, and the use of local opinion leaders have been shown to improve HF care in the inpatient and outpatient settings.[233,248,249] Multifactorial interventions that simultaneously target different barriers to change tend to be more successful than isolated efforts.[250,251] Efforts to monitor and improve the quality of HF care in SNFs will need to take into account the complexity of care, multiple comorbid conditions, social isolation, low health literacy, cognitive impairment, resource limitations, and patient preferences regarding goals of care.[27,94,252]

HF disease management programs and systems of care may improve care in the SNF setting[7,26,27,94,252] and may reduce the frequency of hospitalization and improve quality of life and functional status in outpatients.[7,250,251,253] Disease management for HF spans all settings in which the HF patient may be encountered and emphasizes care coordination and enhanced care transitions.[233,251,253] Aspects of HF disease management programs that could be delivered in a SNF include intensive patient education, encouragement of self-care, and daily assessment of patient status. However, further studies are needed to determine whether HF disease management is feasible in SNFs.[250,251,253]

Recommendations

1. **It is reasonable to evaluate outcomes and process improvements of SNF HF management to include improved survival, reduced hospitalization or readmission rates, fewer symptoms of HF, improved activity level, improved self-management, and maintenance or improvement of level of independence and quality of life *(Class IIa; Level of Evidence C).***
2. **Intensive educational and behavioral interventions for patients and/or caregivers should accompany implementation of HF guidelines *(Class I; Level of Evidence C).***
3. **Chart audit and feedback of results, reminders to consider specific medications or tests, clinical decision support, and use of local HF experts can be used to improve HF care *(Class IIa; Level of Evidence B).***

Conclusions

There has been an increase in the number of patients with HF discharged from the hospital to a SNF.[254] These patients often are frail with significant comorbidity burden, mobility and cognitive impairments, and inadequate home support.[4–6] Opportunities exist to improve assessment and management of HF in SNFs. These efforts require organized SNF staff education and may include collaboration with community- or hospital-based HF experts. In addition to initiatives to improve HF care already discussed, consideration of system-level factors such as higher RN staffing has the potential to prevent avoidable hospitalization. In a study of 6623 nursing home patients discharged to the hospital, higher RN staffing in the SNF reduced hospitalization rates only for patients initially admitted from the hospital and with longer nursing home stays (>30 days).[255] Ultimately, effective HF care in SNFs requires system and provider processes to deliver ongoing interdisciplinary HF management and palliative care to manage symptoms and support quality of life.

This scientific statement includes a review of the evidence and recommendations for HF SNF care that address pharmacology, ancillary services, nursing management, diet, exercise, education, care transitions, management of implantable devices, palliative care, and measurement of quality outcomes. Evidence about SNF care is lacking. More research is needed regarding the efficacy, effectiveness, and implementation of HF chronic disease management in SNFs.

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*Modest.

†Significant.

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Key Words: AHA Scientific Statements, exercise, heart failure, hospital discharge, palliative medicine, rehabilitation, skilled nursing facility.

Appendix 1

HF Baseline Intake Form: To Guide Care and Treatment

Resident Name_____ **Date**_____

Section I (Filled out by the admission nurse):

Admission HF protocol

Protocol Type (circle one)
High Risk Low Risk

Echocardiogram report in chart (circle one) **Yes No**
If NO, Echocardiogram Date Ordered_____

Diet currently on: _____ (≤ 2gm Na recommended)
Starting weight_____**lbs kg (circle one)**
Starting NYHA Classification (circle one) **I II III IV**
Starting Blood pressure (supine & standing)_____
Starting Pulse_____
Number of admissions in 12 mos for HF (estimate)_____

NYHA Classification
Class I Mild: no symptoms, no limits on activity
Class II- Mild: Mild symptoms, slight limitations short of breath with ordinary activity
Class III- Moderate: Marked symptoms and limitations. Short of breath with slight activity
Class IV Severe: Severe symptoms and limitations. Short of breath at rest

Current Heart Failure Medications

(List name , dose and frequency)
Ace inhibitor_____
if no ACE inhibitor, ARB_____
****if on neither state why –if known**
EF≥40 HyperK Hypotension (circle one)
Other_____
Beta Blocker_____
****if not on state why**
EF≥40 Bradycardia Hypotension (circle one)

List of ACE inhibitors	benazepril, **captopril, enalapril**, fosinopril, **lisinopril**, perindopril, quinapril, ramipril, trandolapril, zestril
List of Angiotensin Receptor Blockers	**candesartan**(Atacand), eprosartan, irbesartan, losartan (Cozaar), telmisartan, **valsartan** (Diovan)
Potential Reasons for why no ACE or ARB	History of adverse reaction (angioedema or cough), creatinine>2.5, hypotension, hyperkalemia, other
List of Beta-Blockers	**bisoprolol, metoprolol** (Toprol, Lopressor), **carvediol** (Coreg), **atenolol** (Tenormin)

Education Materials that have been given :

Family	Patient	
_____	____	**Managing your heart failure**
_____	____	**Diet Teaching**

Section 2 (Filled out by Medical Provider):

Heart Failure Etiology
____**Ischemic**
____**Non-ischemic**
____**Other**

Heart Failure Type
_____**Preserved Systolic Function**
_____**Systolic Dysfunction**

Pacemaker _____**Yes** _____**No**
ICD _____**Yes** _____**No**

Nurse Signature_____
Medical Provider Signature_____

Appendix 2

Example of SNF HF Standing Orders

I. Complete Baseline assessment, Determine HF Risk, Obtain Medical Orders:

High Risk: (One of the following)
1) Hospitalized last 6 months for HF exacerbation
2) In the SNF (HF primary or secondary diagnosis)
3) NYHA Class III&IV
4) Hypertensive BP>150/90 mm Hg

Low Risk(Both must be present)
1) >6 months since last hospitalization for HF
2) NYHA I&II

NYHA Classification
Class I Mild: no symptoms, no limits on activity

Class II- Mild: Mild symptoms, slight limitations short of breath with ordinary activity

Class III- Moderate: Marked symptoms and limitations. Short of breath with slight activity

Class IV Severe: Severe symptoms and limitations. Short of breath at rest.

II. Place a heart ICON in the resident's room and a heart sticker on the chart
Record in the MAR *"HF Standing Orders: (high or low) Risk" along with weight directions (see below)*
Place this standing order sheet in the medical record

III. Patient HF Assessments (High Risk assess daily, Low Risk assess weekly)
1. Weight
a. Nursing assistants: weigh resident and record
b. Licensed Nurses record weight in MAR and review the weight trend
Review weights in the last 7-10 days. Report to physician changes in weight (3 pounds in 3 days OR 5 pounds in 7 days)
- High Risk – daily weights; Print weight trends on Mondays and Thursdays
- Low Risk – weekly weights; Print weight trends weekly

2. Signs and Symptoms Heart Failure Symptoms/ New York Heart Association Class

Nursing Assistants, PT, OT, and Dietician to notify the nurse if any signs or symptoms are present.
Document signs and symptoms and 24 hour report sheet.
Supervisors document on the 24 hour report sheet (weight changes, swelling and/or shortness of breath)

3. Vital Signs – high risk daily, low risk weekly or per protocol

IV. Nurse Actions if HF Symptoms reported by nursing assistants or other staff:
A. Nurse to evaluate: perform an advanced assessment and contact the Physician/Nurse Practitioner
- Bulging neck veins, Lower extremity/sacral edema
- Respiratory effort with auscultation of anterior and posterior lungs breath sounds

B. Notify physician and provide blood pressure, pulse, respiration rate, pulse oximetry and weight trends
C. Advance resident to HIGH RISK protocol and document (cardiac note) and update baseline intake form

V. Report Shift to Shift
NYHA class, HF Risk Status (high or low), status of weight changes, shortness of breath, orthopnea, PND, swelling, medication changes, other issues (for example use of salt)

VI. Provide resident and family with Heart Failure Education and Booklet and Monitor Understanding for Home Management

VII. Arrange for 7 day follow up appointment at SNF discharge

Appendix 3

Jugular Venous Pressure Assessment[87]

1. Position patient between supine to sitting to visualize the top of the venous pulsation. Note: Either the internal or external jugular vein can be used to estimate jugular venous pressure.
2. Add the distance in centimeters for jugular pulsations above the sternal angle; subtract the distance in centimeters for jugular pulsations below the sternal angle. Adjust the distance added based on position of patient used to visualize venous pulsation.

Appendix 4

CIED Deactivation Protocol

1. *Confirm patient's capacity to make the decision to withdraw CIED support.* The responsible clinician should assess whether the patient or surrogate adequately understands the facts of his or her medical condition and the likely consequences of the withdrawal of therapy and is free of coercion by others.
2. *Identify the legal surrogate if the patient lacks capacity.*
3. *In a long-term facility where electrophysiological expertise is not immediately available, the attending physician should contact the physician responsible for following the patient's CIED for consultation as to which therapies should be deactivated.*
4. *Adhere to documentation requirements for withdrawing or withholding a CIED.*
   Deactivation of CIED therapies requires a written order from the attending physician. In emergent situations, a verbal order should be followed by written documentation within 24 hours. The written documentation in the medical record should confirm the following:
   (a) That the patient (or legal surrogate) has requested device deactivation
   (b) The capacity of the patient to make the decision, or identification of the appropriate surrogate
   (c) That alternative therapies have been discussed if relevant
   (d) That consequences of deactivation have been discussed
   (e) The specific device therapies to be deactivated
   (f) Notification of family if consistent with patient's wishes
5. *Establish palliative care interventions and provide patient and family support.*
   Patients also must be offered the full range of palliative measures to treat symptoms associated with the progression of their underlying illness, including any new symptoms that may emerge from cessation of device therapy, in particular cessation of bradycardia or resynchronization therapy. Patients may benefit significantly from pharmacological measures that minimize symptoms.

   In addition, the families of patients may require considerable emotional support, especially if they have acted as the patient's decision-making surrogate. Setting expectations for family members regarding the consequences and uncertainties of deactivation is imperative. It may be especially important to have a member of the clergy present for patients with a well-defined faith tradition. Formal consultation with palliative care experts is available in most long-term care facilities. This may be particularly appropriate when there is any uncertainty about symptom management before and after device deactivation. It is generally appropriate to discontinue rhythm monitoring when pacing therapy is withdrawn.
6. *How to deactivate the device:*
   For patients who are well enough to travel to a clinic with programming capability, an outpatient visit may be acceptable for device deactivation. However, because deactivation of therapies may be followed by the patient's rapid demise, such as deactivation of pacing therapy in a dependent patient, the clinic setting may not always be appropriate. For patients in long-term facilities without on-site electrophysiological expertise and who are unable to travel, deactivation should be performed by medical personnel (such as a SNF physician or nurse) with guidance from industry-employed allied professionals.[256] The attending physician should arrange for a programmer to be brought to the patient. This may require the assistance of a physician who follows CIED patients. In many cases, industry-employed allied professionals (IEAPs) who represent the specific manufacturer of the patient's CIED will be called upon to bring a programmer to the patient's bedside. Medical personnel, ideally, the attending physician, would deactivate the CIED using the programmer with technical assistance provided by the IEAP. Although available data from a survey of Heart Rhythm Society members and IEAPs suggest that IEAPs perform deactivation 50% of the time,[186] the Heart Rhythm Society recommends that the IEAP should always act under direct supervision of medical personnel except in rare emergent situations when medical personnel are not available. Communication between an electrophysiologist, SNF personnel, and IEAPs is imperative to direct appropriate deactivation.
7. *Emergent deactivation using a magnet:*
   Although the institution of policies designed to improve proactive communication will reduce unwanted shocks in a dying patient, emergent situations may still occur. All ICDs can be deactivated by placing a doughnut magnet directly over the device. Because devices differ in response when the magnet is removed, the magnet should be left in place until magnet function is confirmed or a programmer is available. All SNFs should have doughnut magnets on-site and readily available.