HEART FAILURE CLINICS: MUCH MORE THAN PHARMACOTHERAPY

ABSTRACT

INTRODUCTION: Heart failure (HF) is a leading cause of hospitalization and death and its prevalence continues to increase. The observation of an association between improved outcomes and care delivered by high volume, specially trained providers has led to the development of disease specific clinics. A wide range of goals exists for the HF clinic such as improvement in clinical outcomes; patient wellbeing and quality of life through early recognition of symptoms and disease progression;, identification of the contributors to HF progression, including poor adherence; management of the medical, socioeconomic and psychologic factors that contribute to morbid events; and development of a mechanism to document and monitor quality.

The purpose of this study is to discuss the multidisciplinary approach to the management of HF through the HF clinic.

MATERIALS AND METHODS: A literature search using data base on Pubmed, Research gate, google scholar, Science direct, Ajol and BMJ was carried out using the key phrases; heart failure, heart failure clinic, management of heart failure.

CONCLUSION: Optimization of guideline directed medical therapy and the establishment of multidisciplinary outpatient heart failure clinics would address several domains of care. Its aim is to provide comprehensive patient management that would lead to reduced hospitalization and better patient outcomes, if appropriately implemented.

INTRODUCTION

Heart failure (HF) is a complex clinical syndrome with symptoms and signs that result from any structural or functional impairment of ventricular filling or ejection of blood. HF is a leading cause of hospitalization and death and its prevalence continues to increase with aging of the population.[1] The main goals of treatment in HF are to reduce symptoms, prolong survival, improve quality of life and to prevent disease

progression. The treatment of HF is dependent on the severity of the disease in terms of the New York heart association(NYHA) functional status. The clinical care of patients with HF encompasses a continuum from the treatment of acute episodes requiring hospitalization to chronic management in the outpatient office setting. The latter provides an opportunity for providers to improve patient care and health outcomes through early identification of symptom progression, utilization of evidence-based medication, quality-of-life evaluation, and patient education to increase adherence.

Outpatient care accounts for a significant proportion of total HF expenditures, and HF is a leading cause of ambulatory visits in the Medicare population.[2] Providers face an expanding list of treatment options. The observation of an association between improved outcomes and care delivered by high volume, specially trained providers has led to the development of disease specific clinics. The ‘‘heart failure clinic’’ has become a vital element in comprehensive care of the patient with HF.[3]. The emphasis over the years has been on pharmacologic and later device or surgical therapy. Non pharmacologic therapy has however been neglected in the care of the HF patient. A wide range of goals exists for the HF clinic: improvement in clinical outcomes; patient wellbeing and quality of life through recognition of symptom and disease progression, identification of the contributors to HF progression, including poor adherence, management of the medical, socioeconomic, and psychologic factors that contribute to morbid events and development of a mechanism to document and monitor quality. The provision of multidisciplinary individualized care has been cited as a way to minimize intermittent ‘‘crises.’’ The documentation and reporting of performance measures, many reflecting processes of care, require the establishment of systems that can also identify and treat patients with HF in a way that will minimize hospitalizations and hence cost.[4]

The establishment of the HF clinic requires the commitment of specific providers, as well as a physical home in which to deliver outpatient care. This commitment must be sustained and should include financial resources adequate to support educational initiatives, provider training, and the infrastructure necessary for delivery of a high level of coordinated multidisciplinary care and quality assessment. This includes a provider-to-patient ratio that will support individualized patient care

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MATERIALS AND METHODS

A literature search using data base on PubMed, Research gate, google scholar,Science direct, Ajol and BMJ was carried out using the key phrases; heart failure, heart failure clinic, management of heart failure

RESULTS

Patients that would benefit most from HF clinics include, patients with recent HF hospitalization, high risk patients such as those with renal insufficiency and patients with multiple comorbidities.

The HF clinics may be predominantly physician-directed or nurse-directed and generally includes or has access to a variety of other professionals with expertise in treating patients with HF.[6] Clinics that cannot provide all facets of advanced HF care should partner with a facility that can offer options such as mechanical support and heart transplantation in eligible populations.

Though there are many articles on disease management programs in HF and some on HF clinics, there remains a lack of published standards on care processes and structural elements in a HF clinic. A previous article provides a list of services available in self-identified HF clinics and a list of ‘‘potential outcome measures,’’ but does not establish standards or provide recommendations in either area.[7]

Many studies have demonstrated that specialized care programs for HF improve patient quality of life, functional status, and satisfaction, while reducing the frequency of preventable hospitalizations. Using the best available published data, this document provides a consensus justification for the important components of a HF clinic, recognizing that not every component can be readily translated to all practice settings or providers.

IMPORTANT DOMAINS OF A HEART FAILURE CLINIC

1. Disease management
2. Functional status assessment

3. Quality of life assessment
4. Medical therapy and drug evaluation
5. Device evaluation
6. Nutritional assessment
7. Follow-up
8. Advance planning
9. Communication
10. Provider education
11. Quality assessment
12. Psychology

1. DISEASE MANAGEMENT

Disease management has been defined as ‘‘a comprehensive, integrated system for managing patients across the health care continuum by using best practices, clinical practice improvement, information technology, and other resources and tools to reduce overall costs and improve measurable outcomes in the quality of care.’’ Disease management is most commonly applied in the outpatient setting to patients with chronic disease or risk states, often with particular concentration on those who are at highest risk for adverse clinical outcomes or excessive consumption of health care resources.[8]

HF disease management programs can be grouped into 3 overlapping categories: Heart failure clinics, Home care and Tele monitoring.

HF clinics deliver care primarily in an outpatient office or in hospital- or office-based clinics using a multidisciplinary team that may include physicians, nurses, pharmacists, nutritionists, social workers, exercise physiologists, and other health care professionals with specialized training and skills in HF management.[9] In keeping with practice guidelines and goals of therapy, the team establishes a longitudinal relationship with each patient to provide optimization of medications, rigorous follow-up, patient/caregiver education, rapid response to clinical concerns and coordination of care.

The HF clinic may provide oversight, personnel, and support for the other components of a formal disease management program. Home care may be performed in collaboration with home health care vendors employing visiting nurses or other home health care professionals. Home visitation by physicians has been reported as another strategy for HF disease management. Care can also be provided from a distance to homebound patients using trans-telephonic methods by nurses with specialized training.[10]

The HF clinic may use technology to monitor patients in the home setting, whether they are homebound or able to make intermittent clinic visits. Body weight, blood pressure, and heart rate may be conveyed electronically to the HF team on a scheduled or ad hoc basis for review and action. Additional innovations in this area have been reported;[11] however, not all programs will be equally committed to or logistically capable of delivering expansive home care and tele-management services, although these services are a beneficial component of a HF clinic.

Achieving the best possible clinical outcomes and cost effective treatment through the ideal delivery of modern, evidence-based HF care is challenged by many factors, including the decentralized nature of health care delivery; the cost, complexity, and changing standards of care for HF; the need to identify and manage side effects, drug interactions, and other complications of treatment programs; and a patient population that is elderly, often with multiple concomitant medical disorders. A large and growing body of evidence suggests that the comprehensive disease management offered by the HF clinic addresses many of these barriers and thus will be successful in improving patient quality of life and other clinical outcomes, such as mortality and hospitalizations.[2] Because studies vary in the disease management interventions used, the resources available, and the patient populations studied, it is difficult to isolate the factors key to the success of a disease management program in any given HF clinic.

Components of a disease management program of a heart failure clinic

The HF Society of America (HFSA) recommends that HF disease management programs include multiple components based on patient characteristics and needs. Many of these recommendations are applicable to HF clinics and include the following:

a. Comprehensive education and counseling individualized to patient needs and cultural background and including family members and caregivers when possible and applicable.
b. A philosophy that promotes self-care, including self-adjustment of diuretic therapy in appropriate patients (with family member/care giver assistance, as necessary).
c. Optimization of medical therapy, including an emphasis on behavioral strategies to increase adherence.
d. Mechanisms to ensure appropriate follow-up after hospital discharge or after periods of instability and early attention to signs and symptoms of fluid overload.
e. Ability to provide assistance with social and financial concerns either directly or through appropriate referrals.
f. A provider-to-patient ratio that will support individualized patient care, recognizing that the numerical value of such ratios has not been established by research and is likely dependent on patient population and provider type. Providers include physicians, nurse practitioners, and other qualified health professionals.
g. An infrastructure that allows for integration and coordination of care between the primary care physician and HF care specialists and with other agencies, such as home health and cardiac rehabilitation.[12]

2. FUNCTIONAL STATUS ASSESSMENT

The functional assessment of ambulatory HF patients in the outpatient setting is an important component of the initial and follow-up evaluations. Three methods to assess functional status have been subject to extensive research and clinical use: evaluation of New York Heart Association (NYHA) class; the 6-minute walk test (6MWT); and cardiopulmonary exercise stress (CPX) testing.[13] BNP testing may be useful in certain clinical settings, but its value for guiding therapy requires further study. Although these are the standard functional assessments used in the outpatient clinic, other tools can be used to assess functional assessment, including pedometers and physical activity scales (eg, Duke Activity Index scale, the International Physical Activity Questionnaire).[14]

NYHA Class: The NYHA classification is used widely in clinical practice and correlates with likelihood of death in stepwise fashion and mode of death in patients with HF and left ventricular (LV) systolic dysfunction. Using this simple tool, dynamic risk assessment is feasible for patients who progress or improve. NYHA Class also allows for assessment of the risk of nonfatal events, such as hospitalization, the appropriateness of interventions, and the response to interventions.[15] However, assessment of functional class is often performed without rigor and consistency: inter observer variability is high, with nearly 50% discordance between cardiologists.

6MWT: The 6MWT is a simple clinical tool that may reflect a patient's ability to carry out activities of daily living to a greater degree than peak oxygen uptake by cardiopulmonary exercise testing. However, although the 6MWT correlates moderately with peak oxygen update (R values range from 0.68 to 0.76),[16] its utility with respect to risk stratification and assessment of response to therapies is less well defined. The 6MWT should be conducted using a standardized protocol, recognizing that 15% to 20% will be unable to perform the test because of marked obesity, arthritis, neurologic conditions, advanced age, or severe lung disease. A 6MWT distance less than 300 m confers an increased risk of mortality. The relationship between change in symptoms and change in the 6MWT distance is not robust, but in most populations a difference of 50 m is considered clinically significant.[17]

CPX Testing: Cardiopulmonary exercise testing is a more sophisticated method to assess exercise performance and can provide baseline prognostic information as well as dynamic risk assessment.[18] CPX has been combined with NYHA classification to determine suitability for high risk interventions such as cardiac transplantation. Peak oxygen values less than 14 mL/kg/min carry an increased risk of 2-year mortality; patients with a peak oxygen less than 12 mL/kg/min in an appropriate age category may be considered for an accelerated evaluation for advanced therapy, such as LV assist devices or cardiac transplantation.[19]

The cardiopulmonary exercise test can be administered using a standard bicycle exercise ramp protocol or treadmill protocol.56 CPX requires trained personnel to monitor the test and interpret the results; ideally, test-retest variability at peak oxygen consumption should be less than 10%.

REASON FOR A FUNCTIONAL STATUS ASSESSMENT

Four categories of information can be obtained from conducting a proper functional assessment: baseline prognostic risk with respect to mortality and cardiovascular morbidity; determination of dynamic risk and the change in risk over time; determination of the appropriateness of therapies for the treatment of HF; and the assessment of response to administered therapies.

COMPONENTS OF A FUNCTIONAL STATUS ASSESSMENT

The components of functional assessment in a HF clinic include but are not limited to the following:

a. Assessment of NYHA functional class at every clinic visit for patients with symptomatic HF documented in the medical record. A baseline 6MWT is desirable, with follow-up assessments as clinically necessary. Results should be easily accessible in the medical record and significant changes should be noted.
b. Baseline and serial CPX assessments in patients with NYHA Class III/IV symptoms who are candidates for advanced therapies such as LV assist device or cardiac transplantation or to measure response to therapy. Testing should be done by trained personnel with appropriate quality control; it is not necessary for the procedure to be performed in the HF clinic itself, especially if technical expertise is lacking.

3. QUALITY OF LIFE ASSESSMENT

Two important goals of HF treatment are to increase quality of life and improve health status, terms often used interchangeably. Health status refers to the sum of a patient's symptoms, functional status, and health-related quality of life. Quality of life is by definition patient-centered and may include not only the patient's view of his or her own level of functioning, but how that functioning differs from expectations. Most instruments combine components of quality of life and other measures of health status. They are divided into generic measures that are used regardless of the condition and disease-specific measures. Both have been extensively reviewed.[20] The former include the 36-item Medical Outcomes Study short-form composed of 8 domains. An abbreviated version of the instrument, the SF-12, captures 90% of the variance and represents a validated alternative. Another option is the EuroQol-5D, a 5-item survey covering mobility, self-care, activities, pain, and anxiety/depression using a visual analog scale (0 to

100).[21] The disease-specific instruments include the Chronic Heart Failure Questionnaire, which incorporates 20 items measuring dyspnea, fatigue, emotional status, and mastery domains. The Minnesota Living with Heart Failure Questionnaire is a 21-item survey scored 0 to 105, with 105 indicating the worst health status. Both a physical and an emotional dimension have been identified; a change in score of 5 or more is considered to be clinically significant.62 The Kansas City Cardiomyopathy Questionnaire is a 23-item survey scored 100 to 0, with 0 indicating the worst health status. Domains include physical limitations, symptoms, self-efficacy and knowledge, social interference, and quality of life. A change of 5 or more is thought to be clinically important.[22] These measures can be self-administered whenever feasible or obtained during a structured interview. Their validity, reliability, and responsiveness to clinical change have been evaluated.

Reason for a quality of life assessment

Scores on the Minnesota Living with Heart Failure Questionnaire and Kansas City Cardiomyopathy Questionnaire have been associated with survival and hospitalization for outpatients with HF.[23] Although correlated with other measurements of functioning (NYHA Class, 6MWT, LV ejection fraction), they have independent predictive value for death and hospitalization. Though infrequently performed in practice, in the clinical trial setting several domains of the Minnesota Living with Heart Failure Questionnaire and Kansas City Cardiomyopathy Questionnaire have been associated with mortality and hospitalization, including activities of daily living, general health, and HF symptoms.[24] Objective measurement may also add valuable information about the patient's perception of disease, and serial measurements provide important insight into the patient's trajectory. The health status/quality of life measures allow standardized assessment that can be self-administered by patients before clinic visits. They can be used between clinic visits to determine trajectory of health status. The surveys can also be used to identify higher risk patients for more intensive interventions, such as disease management and home monitoring.

COMPONENTS OF A QUALITY OF LIFE ASSESSMENT

The quality of life assessment components in a HF clinic include but are not limited to the following:

a. Familiarity with delivery and interpretation of at least 1 HF-specific health status/quality of life survey. Questionnaire administration at least once with every patient is desirable, repeated on an individualized basis, especially with changes in clinical status. The use of quality of life tools to screen patients for improvement or deterioration is also desirable.
b. Scoring and recording questionnaire results and an interpretation in the medical record.
c. An accessible medical record that can facilitate tracking of individual results and cumulative statistics for the clinic as a whole.

4. MEDICAL THERAPY AND DRUG EVALUATION

Evidence-based practice guidelines for the pharmacotherapy of HF have been established by HFSA and other professional organizations. Compliance with these guidelines, however, varies considerably by region, hospital, and prescribing physician. HF clinics should include features that will promote optimal medication prescribing practices, including an effective drug therapy evaluation process.

REASONS FOR MEDICAL THERAPY AND DRUG EVALUATION

The beneficial effects of angiotensin converting enzyme (ACE) inhibitors, mineralocorticoid receptor antagonists, beta blockers and recently sodium glucose co transporter2 inhibitors, on mortality, hospitalization, and quality of life in heart failure patients have been well-recognized. There is continued underutilization of these classes of drugs in routine clinical practice. Data from the Acute Decompensated Heart Failure National Registry indicate that at the median hospital, 83.6% of eligible patients were discharged on either an ACE inhibitor or angiotensin receptor blocker, with a range from 68.4% at the 10^{th} percentile to 93.9% at the 90^{th} percentile. Similar data have been reported elsewhere.[25] Medication utilization in the outpatient setting has been less well studied, but is likely to be lower and more variable than in the inpatient setting, in part because medications are often discontinued because of side effects or cost.

In addition to under prescription of recommended drug therapies, many patients receive these agents at doses well below those proven to be effective in clinical trials and recommended by practice guidelines.[26] Although the reasons for under dosing are not well characterized, it is likely that physician perceptions

about the potential for serious adverse side effects and uncertainty about the incremental benefit of higher dosages, particularly in clinically stable patients, are important factors limiting titration of medications to recommended dosage levels.

The primary objective of HF clinics is to provide high-quality care in accordance with evidence-based practice guidelines.[27] Mechanisms should be in place for systematic identification of patients who are not receiving optimal dosages of all medications, and for initiating and titrating drugs to recommended levels.

Drug evaluation involves a review process of the medical history and a comprehensive assessment of drug therapy. Particular emphasis should be given, to the appropriateness of the medical treatment regimen with respect to published standards of care, potential drug interactions, adverse effects, allergies and patient understanding of the rationale for each drug, proper drug dosing, timing of administration, and adherence to prescribed therapy. A comprehensive drug evaluation can effectively reduce hospital admission rates, morbidity and potentially improve survival.[28] The goals of such an evaluation are to: devise a medical regimen consistent with evidence based standards of care minimize interactions and other drug-related side effects improve patient adherence, quality of life, and satisfaction reduce the cost and complexity of the medical regimen improve clinical outcomes. Several studies involving intensive reviews of patients' medical records and treatment plans have demonstrated improvement in various clinical outcomes compared with usual care.[28]

COMPONENTS OF MEDICAL THERAPY AND DRUG EVALUATION

Components necessary to achieve optimal prescribing and dosing of proven medical therapies in a heart failure clinic include but are not limited to the following:

a. Medical therapy that is in accordance with established HF practice guidelines and recommended dosage levels. Beta-blockers, Angiotensin receptor antagonists, ACE inhibitors, Angiotensin receptor neprilysin inhibitors, Mineralocorticoid receptor antagonists and sodium glucose co-transporter 2 inhibitors form the bedrock of management of HF with reduced ejection fraction.
b. Clear and readily accessible documentation of reasons for not prescribing recommended medical therapies or for not titrating to recommended dosage levels.

c. When appropriate, self-management of diuretics, including adequate patient education and tracking functions to ensure safety.

d. Drug evaluation when the patient is enrolled in the HF clinic, to be repeated as indicated by clinical circumstances. The evaluation may be performed by the physician, a specially trained nurse, or a clinical pharmacist. To improve the effectiveness of the evaluation, the patient's family/caregiver should be engaged if possible, and patients should be advised to bring all medication bottles or a list of all current medications.

Components to be considered for a drug therapy evaluation include the following

I. Clear, comprehensible, and standardized written instructions for the patient/caregiver regarding the indications for each drug, common side effects, and medications and dietary choices to avoid. Any changes to the drug regimen should be clearly explained to the patient/caregiver and documented in the medical record

II. A thorough review of all medications, including over-the-counter medications and supplements, in the context of medical comorbidities, dietary habits, and other patient specific factors to avoid potential adverse drug-drug or drug-disease interactions.

III. Comprehensive review of the patient's allergy history. Reported intolerances to specific medications should be distinguished from true allergies, possibly through a re challenge, when such medications are critical to patient care.

IV. Assessment of adherence. At each clinic visit, patients should be asked specifically about adherence to the medication regimen, especially if there is evidence of clinical deterioration. When non adherence is determined, causes should be identified and a strategy implemented to improve medication-taking behavior.

5. DEVICE EVALUATION

Implantable cardioverter defibrillators (ICDs) and biventricular pacing (CRT-P and CRT-D) are being used increasingly in patients with LV dysfunction and HF.[29] The role of the HF clinic in this aspect of care is evolving. The Cardiologist in HF clinics should be able to identify patients who may be candidates for

device therapy. They should also evaluate the devices and address programming issues or when there is the need to upgrade devices.

REASONS FOR DEVICE EVALUATION

The option of implantable cardiac devices and the advent of invasive monitoring capabilities mandate that the HF clinic institute a formal system to ensure that devices are monitored appropriately, including referral to providers who manage devices, if rhythm monitoring is not performed directly in the HF clinic.[30] In addition, HF clinic personnel should have the requisite training and experience to manage questions about device functioning from remote sites and to institute appropriate algorithms in response to reports of rhythm disturbances, device malfunction, and changes in monitored physiologic parameters (if the HF clinic is committed to the clinical interpretation of these parameters).

The HF clinic has the option of referring the patient to an electrophysiologist for device interrogations and for interventions based on the results of the interrogations. However, with the advent of dually trained physicians[31] or establishment of collaborative multidisciplinary care within the clinic framework, many of the programming tasks can be accomplished in the HF clinic itself. To provide continuity and seamless transitions in care, the HF clinic should establish a clear mechanism for communication with other physicians about device status and should have a recording system to document changes in device settings whether they are implemented within or outside the HF clinic.

Several considerations apply to appropriate patient identification and selection for device therapy. First, as outlined in guidelines and emphasized here, reversible causes of cardiomyopathy should be sought and time allowed for improvement in clinical status and LV function following guideline-based treatment.[32] Guideline directed optimal medical therapy should be implemented before device therapy. Life expectancy should also be reviewed in the context of practice guidelines.[33] Clear discussions with the patient regarding the benefits and risks of devices like an implantable cardio-defibrillators should take place.

COMPONENTS FOR DEVICE EVALUATION

Some components related to device therapy in a heart failure clinic include the implementation of procedures that standardize documentation of device functioning and patient wellbeing; facilitation of communication with the electrophysiologist (if participating in the care of the patient); and identification of patients who might benefit from the implantation of a device.

Components relevant to patients without an Implantable Cardiac Device

a. A system of screening that facilitates the identification of patients who might benefit from device therapy.
b. Documented discussion of therapeutic options, including potential benefits and risks, with each patient being considered for device therapy.

Components relevant to patients with a Preexisting Implantable Cardiac Device

a. A site registry, updated and reviewed regularly, of all patients in whom cardiac devices have been implanted.
b. A clear and consistent system for device evaluation, including documentation in the medical record, and a mechanism to monitor patients with a frequency established by a protocol.
c. Coordination of care with electrophysiologists to avoid duplication of services and conflicting interventions.
d. A system to respond to alerts or recalls produced by regulatory agencies or device manufacturers. This includes a mechanism to rapidly identify affected patients and to permit early clinical follow-up.

6. NUTRITIONAL ASSESSEMENT

Nutritional screening, assessment, and guidance are essential components of patient management in the HF clinic. Special attention should be given to sodium and fluid restriction. Tailored nutritional assessment and management is recommended for patients with comorbid conditions such as diabetes, hyperlipidemia, renal disease, alcoholism, cardiac cachexia, and obesity. The process should begin when a patient is first diagnosed or admitted with HF. Outpatient follow-up is essential for prevention of

readmission. A registered dietitian or cardiovascular practice nurse is generally in the best position to provide nutritional counseling, but it can be provided by other knowledgeable providers.

REASON FOR NUTRITIONAL ASSESSMENT

Non-adherence with diet accounts for at least 18% of preventable readmissions for HF. Adherence to sodium restriction is particularly important, as it complements pharmacologic therapy of HF and is associated with a reduction of diuretic dosage. Non-adherence can result in a diuretic-induced electrolyte imbalance, such as hyponatremia or hypokalemia.[34]

Comorbidities in patients with HF, such as coronary artery disease, hyperlipidemia, diabetes mellitus, and chronic kidney disease, often require special dietary management. Depression may also contribute to poor nutrition and non-adherence to nutritional plans. The overall goal of such nutritional management is to retard disease progression and prevent episodes of decompensation.[35]

The risks represented by both obesity and cachexia should be recognized. The latter is an independent risk factor for poor outcome.[36] Right-sided HF can contribute to cachexia by affecting absorption of nutrients across the gut wall or by impairing hepatic synthetic function. Obesity may be linked to insulin resistance, glucose intolerance and plasma volume expansion leading to volume overload and increased systemic vascular resistance.

COMPONENTS OF NUTRITIONAL ASSESSMENT

Nutritional assessment in a HF clinic should occur in the context of patient comorbidities. The components include:

a. A nutritional evaluation of the patient with HF, by a registered dietitian with knowledge and expertise in working with patients with HF, by an advance practice nurse with special training in nutrition, or by some other knowledgeable provider. An initial nutritional screening, assessment, and plan of care should be performed at the time of HF diagnosis and whenever possible during subsequent HF clinic appointments, taking into account ethnic, religious, and gender influences on nutritional habits and including, when possible, the person responsible for meal preparation. Recommendations regarding dietary sodium restriction and, in specific cases, fluid restriction are

particularly important, with appropriate documentation and reinforcement whenever clinically indicated.

b. A system to measure, record, and track body weight and body mass index on a regular basis. Calorie counts should be obtained if cachexia is clinically suspected and appropriate nutritional supplementation prescribed if unintended weight loss is documented.

7. FOLLOW UP

Heart failure is a chronic disease that cannot be adequately addressed by treating acute episodic exacerbations. Continuity of care is a hallmark of HF care, and the HF clinic is uniquely positioned to provide focused evaluation and management, thereby limiting potential complications, such as early rehospitalization. A major contributor to early rehospitalization is inadequate discharge planning. Patients should be told how to recognize and respond to a return of symptoms.[37] Providers should establish a mechanism for early outpatient follow-up after a HF hospitalization, emergency department visit, and both unscheduled and scheduled outpatient HF clinic visits. History and physical examination by the provider may be followed-up with repeat imaging, blood chemistries, functional studies, or a repeat visit with a dietitian or social worker. Strategies vary with each patient presentation, but there is consensus about the need for regular evaluation of patients with HF at risk for adverse events and rehospitalization. The frequency of follow-up will be guided by clinical judgment. The use of risk models may help guide clinician decision-making.[38]

REASONS FOR FOLLOW-UP

Provision of follow-up care is essential for any chronic disease that limits patient well-being, is punctuated by repeated hospitalizations, and has a high rate of morbidity and mortality. HF is the leading cause of 30-day rehospitalization in the Medicare cohort and has a high associated 1-year mortality rate. Lack of continuity may contribute to unnecessary utilization of resources, partly through inadequate provider-patient and provider-provider communication. To be consistent with the 2006 HFSA practice guideline, patients in a HF clinic should be followed until they or their family/caregiver demonstrate independence in following the prescribed treatment plan, adequate or improved adherence to treatment guidelines, improved functional capacity, and symptom stability.[5] Higher risk patients may require ongoing follow-up.

Patients who experience increasing episodes of exacerbation or who demonstrate instability after discharge from a program should be referred again to the clinic.

Components of follow up in a heart failure clinic

The major focus of follow-up is the establishment of well-defined parameters for patient monitoring after a hospitalization or outpatient visit and the confirmation of patient/ caregiver comprehension about these parameters. The follow-up components in a HF clinic include:

a. Systematic follow-up after HF hospitalization or emergency department visit. At the time of discharge, an outpatient visit should be scheduled in the HF clinic within 7 to 10 days, as clinically indicated. Higher risk patients should receive follow-up no longer than 72 hours after discharge via such means as telephone contact, home health visit, telemonitoring, or clinic visit. The patient should be instructed on symptoms that might occur and mechanisms to contact a provider at the HF clinic if symptoms recur. A clearly defined plan of action should be provided to the patient or caregiver in case of a sudden or unexplained change in clinical status.
b. Systematic follow-up after an outpatient HF clinic visit. A return visit should be scheduled within no more than 12 months for a stable patient and sooner for patients with advanced symptoms.
c. Serial evaluations of electrolytes, renal function, and other objective monitoring, such as assessment of LV function, with a frequency determined by the provider as part of individualized treatment plans. These frequencies may also be set by reasonable clinical standards of care; for example, at a minimum, patients on diuretics should have electrolytes and renal function monitored at least semiannually.
d. Telephone contact or the use of telemonitoring devices, if available, on an individualized basis.

8. ADVANCE PLANNING

The AHA advocates that advanced HF patients be referred to specialized HF teams to assess suitability for advanced care or palliative care[39]. They should be approached by the provider in an empathic and thoughtful manner to discuss care preferences before the disease has progressed to its near-terminal

stage.[40] The process of mapping out the types of medical and nonmedical care a patient would like to receive, before the clinical condition makes it difficult for the patient to express these wishes, is known as advance care planning. This type of planning is an ongoing discussion between the patient, care providers, spouse, family members, and significant others. It is a dynamic process that may require modification or revision as the patient's illness and thought processes evolve.

Advance care plans address the challenges of living with chronic illness, the complications likely to arise, and the treatment options available. Conversations about advance directives often include decisions about code status and the patient's desire for cardiopulmonary resuscitation.[41] Explicit consideration of device deactivation is appropriate for patients with end-stage HF. Discussions may also cover invasive procedures, surgery, and hospitalizations. The priority is to engage the patient in such a way that values and goals can be elicited. There are no set formats for initiating these discussions, but open-ended questions represent one effective method.[42]

A cardinal feature of advance care planning is the advance directive, which can take various forms, including a living will, health care proxy, or durable power of attorney for health care. Advance directives can be oral or written and, beyond documenting the patient's preferences, may also name a surrogate to make medical decisions if required. The identification of a surrogate also offers an opportunity for the physician to ask about what the patient has told, or would want to tell, the surrogate about his or her preferences.

Reasons for advanced planning

With advance care planning, physicians can improve patient satisfaction and provide compassionate care at the end of life that is in accordance with the patient's wishes. However, because the patient remains autonomous, the type and intensity of care designated in advance care planning comes into effect only if the patient can no longer express his or her intentions.

Components of advance planning

It is the obligation of the provider to introduce the topic, provide resources, and offer access to a structured process that will lead to clarity about patient preferences. The components related to advance care planning in a HF clinic in regard to advance planning include but are not limited to the following:

a. Incorporating advance care planning into the practice. The care team should be knowledgeable and have the ability to implement advance care planning concepts.
b. Incorporating advance care planning discussions into the longitudinal care of HF patients.
c. Referring patients to other professionals and resources for assistance, if and when they express an interest in devising a formal advance directive.
d. Recording the status of advance care planning in the patient chart, including a copy of the advance directive, if one exists.

9. COMMUNICATION

Effective communication is associated with improved patient satisfaction and is ethically required so that patients and families can participate as much as desired in care decisions. Shared decision-making goes beyond informed consent by making the ends of care, as well as the means of care, a matter of negotiation. Shared decision-making is the best way to assure that patients and families receive care that is consistent with their own goals.[43]

The barriers to effective communication are significant. In studies involving interviews of older patients with advanced HF, both a failure to share understandable information with the patient and a lack of discussion about prognosis have been reported.[44] Data from the Study to Understand Prognoses and Preferences for Outcomes and Risks of Treatments and other studies indicate that physician and patient perceptions about interactions, including the content of discussions, are often conflicting.[45] All verbal and written communication should be at an appropriate level for the patient and family members. The style of communication has been identified as one factor critical to its success.

Further, given the high prevalence of comorbidities, patients often have multiple providers, requiring additional interactions within the health care system. Lack of communication between providers can lead to medication errors, conflicting treatment plans, and mixed messages for the patient about disease severity, prognosis, and best approaches to care.

Multiple layers of communication exist between provider and patient and among providers (including family members, physicians, nurses, and ancillary health care personnel). The patient, as an autonomous being, requires effective communication in order to receive information about prognosis, treatment options, adherence, advance care planning, and other facets of care. Incomplete or poor information flow between provider and patient or between providers can lead to significant patient dissatisfaction, compromised medical outcomes, and increased hospitalizations. Discordance has also been reported about predictions of life expectancy between patients and validated risk stratification models, suggesting a potential deficit in patient understanding and patient-physician communication.[46]

There are no formal standards that can be used to measure the effectiveness of communication between provider and patient. Mechanisms that can be implemented to ensure effective communication across providers remain undefined. Nevertheless, given the importance of improving the quality and efficiency of communication, providers should be focused on the role communication plays in HF care and should provide access to education as necessary.

Components of effective communication

Some components of effective HF communication in the HF clinic include

a. A trusting patient-provider relationship that facilitates open communication.
b. Timely dialogue between providers across the care continuum. The patient should be informed that there is an adequate flow of information between providers. Documentation of such communication is essential.

10. PROVIDER EDUCATION

The Institute of Medicine recognizes that professional education is an integral component in the quality of HF care, a fact confirmed in many studies.[47] It is also recognized by clinicians, as reflected in a national

survey of clerkship directors in internal medicine in which HF was ranked 4th of a possible 60 disease targets. Provider education in the HF clinic encompasses a full range of initiatives designed to ensure provider competence. Competence includes the knowledge of standards of care and their pathophysiologic foundations, effective communication skills, and development of a culture in the practice that is focused on performance assessment and continuous quality improvement. Educational options include such formats as lectures, skills workshops, online activities, and practice-based assessment and learning.[48]

Decision-making in HF care is a dynamic process, given frequent advances in clinical trials and translational research that provide the framework for evidence-based practice. The literature on practice assessment and ongoing performance measurement emphasizes the central importance of provider education, especially when focused on the application of practice guidelines. Provider education can be defined by the implementation of standardized learning about treatment and evaluation modalities, practice assessment, performance measures, metrics, and mechanisms that help to ensure that improvements in HF care are readily translated into daily practice. An approach that incorporates practice-based learning has the potential to improve compliance with HF guidelines in the ambulatory setting in large group practices and in hospital care.[49]

Components of provider education

The educational program of a HF clinic should be designed to update clinical competencies.[50] The components in a HF clinic include but are not limited to the following:

1. Participation in formal continuing education preferably reflecting the key components of the 2006 HFSA Comprehensive Heart Failure Practice Guideline or the ACC/AHA 2005 Practice Guideline.

A. Training for physicians that is consistent with Level 3 Core Cardiology Training Symposium requirements or, if the clinic provides services for patients with advanced HF and recipients of heart transplants, is consistent with the requirements of the ABIM secondary subspecialty in advanced HF cardiology and transplantation.

B. Training for nurses that includes pathophysiology, pharmacology, patient self-care management approaches, psychosocial influences on patient behaviors, and quality of-life and palliative care issues.

2. The availability of multiple educational modes in the critical areas of HF care to maximize the translation of education into practice.[51]

3. Periodic practice assessment as a component of practice-based learning.

11. QUALITY ASSESSMENT

Quality of heart failure care can be divided into outcome, process, and structural components.[52] The degree to which the HF clinic can evaluate quality using measures that reflect these components varies, depending on many factors, such as payer mix and clinic commitment.

Outcome Measures

Outcome measures, such as survival and quality of life, are the most important quality measures from both the patient's and society's perspective. They are influenced by patient factors and thus require substantial clinical data to adjust for patient characteristics. However, there are scant data available that can be applied to the analysis of risk-adjusted survival for outpatients with chronic HF. This situation is in contrast to the inpatient and, more recently, the early outpatient setting. The Center for Medicare and Medicaid Services has reported 30-day mortality after a HF admission at the hospital level using administrative data to adjust for risk.[53]

There are at present no convenient tools for tracking readmission rates. The threshold for admission may vary widely depending on patient preference and across practices depending on the ability to deliver aggressive outpatient care. For those health care systems that are able to track these data, a conservative labeling of outliers is appropriate given the limitations of risk adjustment. Patient satisfaction is an additional important outcome related to quality, although there is no established HF-specific instrument.

Process Measures

Process of care measures are the most accepted indicators of quality for hospitals and individual providers. Adoption of many of these process measures have been shown to improve outcomes in randomized trials. Furthermore, these measures can be obtained using many existing medical record systems. The HFSA has endorsed the performance measures published by the ACC/AHA, reflecting consensus that non-adherence with the measures indicates poor quality.[54,55]

The performance measures pertaining to outpatient HF care include but are not necessarily limited to: measurement and documentation of LV ejection fraction (initial encounter); weight measurement; blood pressure measurement; assessment of symptoms of fluid overload; assessment of signs of fluid overload; assessment of activity level and patient education. Non vitamin k oral anticoagulants and warfarin are initiated for patients with paroxysmal or chronic atrial fibrillation.

Structural Measures

Few studies have examined specific structural elements of HF care and their impact on outcome. Such measures in the future may include the routine reporting of quality measures to a central regulatory body, such as the Center for Medicare and Medicaid Services, or a registry.

Why quality assessment should be done in a heart failure clinic

Quality assessment is a crucial component in the evaluation of the heart failure clinic, given the potential for identification of structural and process flaws that, when corrected, can favorably impact patient care and outcomes. In addition, quality assessment allows for benchmarking, a process by which the HF clinic can gauge its performance relative to other practices and practice settings and monitor performance over time.

Components of quality assessment

The quality assessment components in a heart failure clinic include.

a. Adoption of a philosophy that openly encourages process improvement. The HF clinic should set goals for quality improvement and institute structures and processes, such as morbidity and mortality reviews, designed to improve performance.
b. Development or participation in an existing review procedure (eg, a registry) to evaluate care using the ACC/ AHA performance measures. Treatment measures known to improve survival, such as the use of ACE inhibitors and b-blockers, should be given priority.
c. Use of data to assess the performance of the specific HF clinic relative to other providers and to identify areas that require improvement, including patient satisfaction.
d. Flexibility in the use of assessment and reporting tools that will accommodate changes in performance measures and mechanisms to capture and report data.
e. Use of processes that allow for regular review of performance reports.
f. A process for tracking admission rates and, where feasible, heart failure mortality rates.

CONCLUSION Heart failure continues to be associated with increased morbidity and mortality worldwide with worse outcomes in resource poor countries. With evidence of lack of optimization of guideline directed medical therapy, the establishment of multidisciplinary heart failure clinics addressing several domains with aims to provide comprehensive patient management would lead to reduced hospitalization and better patient outcomes and should be an essential component of outpatient HF care.

REFERENCE

1. Salim S. Virani, Alvaro Alonso, Hugo J. Aparicio, Emelia J. Benjamin, Marcio S. Bittencourt, Clifton W. Callaway, April P Carson et al American Heart Association. Heart disease and stroke statistics 2021 update.2021;143:649
2. Center for Medicare and Medicaid Services data compendium. Available from http://www.cms.hhs.gov/DataCompendium 2020
3. Konstam MA. Executive Council of the Heart Failure Society of America. Heart failure training: a call for an integrative, patient focused approach to an emerging cardiology subspecialty. J Am Coll Cardiol 2004; 44:1361-1362.

4. McAlister FA, Stewart S, Ferrua S, et al. Multidisciplinary strategies for the management of heart failure patients at high risk for admission: a systematic review of randomized trials. J Am Coll Cardiol 2004; 44:810-819.

5. Adams KF, Lindenfeld J, Arnold JM, Baker D, Barnard DH, Baughman KL, et al. HFSA 2006 Comprehensive Heart Failure Practice Guideline. J Card Fail 2006; 12:1e119.

6. Gustafsson F, Arnold JMO. Heart failure clinics and outpatient management: review of the evidence and call for quality assurance. Eur Heart J 2004; 25:1596-1604.

7. Silver MA. The heart failure clinic. In: Hosenpud JD, Greenberg BH, editors. Congestive heart failure. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2007. p. 656-659.

8. Hunt SA, Abraham WT, Chin MH, Feldman AM, Francis GS, Ganiats TG, et al. ACC/AHA 2005 guideline update for the diagnosis and management of chronic heart failure in the adult. Circulation 2005; 112:154-235.

9. Rich MW, Beckman V, Wittenberg C, et al. A multidisciplinary intervention to prevent the readmission of elderly patients with congestive heart failure. N Engl J Med 1995; 333:1190-1195.

10. Gattis WA, Hasselblad V, Whellan DJ, O'Connor CM. Reduction in heart failure events by the addition of a clinical pharmacist to the heart failure management team: results of the Pharmacist in Heart Failure Assessment Recommendation and Monitoring (PHARM) Study. Arch Intern Med 1999; 159:1939-1945.

11. Grancelli H, Varini S, Ferrante D, Schwartzman R, Zambrano C, Soifer S, et al. Randomized Trial of Telephone Intervention in Chronic Heart Failure (DIAL): study design and preliminary observation. J Card Fail 2003; 9:172-179.

12. Ypenburg C, Bax JJ, van der Wall EE, Schalij MJ, van Erven L, et al. Intrathoracic impedance monitoring to predict decompensated heart failure. Am J Cardiol 2007; 99:554-557.

13. Oddone EZ, Weinberger M, Giobbie-Hurder A, Landsman P, Henderson W. Enhanced access to primary care for patients with congestive heart failure. Veterans Affairs Cooperative Study Group on Primary Care and Hospital Readmission. Effective Clin Practice 1999; 2:201-209.

14. Williams SG, Ng LL, O'Brien RJ, Taylor S, Wright DJ, Li YF, et al. Complementary roles of simple variables, NYHA and N-BNP, in indicating aerobic capacity and severity of heart failure. Int J Cardiol 2005; 102:279-286.

15. Craig CL, Marshall AL, Sjo¨stro¨m M, Bauman AE, Booth ML, Ainsworth BE, et al. International physical activity questionnaire: 12-country reliability and validity. Med Sci Sports Exerc 2003;35: 1381-1395.

16. Zugck C, Kruger C, Durr S, Gerber SH, Haunstetter A, Hornig K, et al. Is the 6-minute walk test a reliable substitute for peak oxygen uptake in patients with dilated cardiomyopathy? Eur Heart J 2000;21: 507-508.

17. Passantino A, Lagioia R, Mastropasqua F, Scrutinio D. Short-term change in distance walked in 6 min is an indicator of outcome in patients with chronic heart failure in clinical practice. J Am Coll Cardiol 2006; 48:99-105.

18. Corra U, Mezzani A, Bosimini E, Giannuzzi P. Prognostic value of time-related changes of cardiopulmonary exercise testing indices in stable chronic heart failure: a pragmatic and operative scheme. Eur J Cardiovasc Prev Rehabil 2006; 13:186-192.

19. Weber K, Janicki J. Cardiopulmonary exercise testing: physiologic principles and clinical applications. Philadelphia: WB Saunders; 1986.

20. Myers J, Gullestad L, Vagelos R, Do D, Bellin D, Ross H, et al. Cardiopulmonary exercise testing and prognosis in severe heart failure: 14 ml/kg/min revisited. Am Heart J 2000; 139:78-84.

21. Wilson JR. Exercise and the failing heart. Cardiol Clin 1987;5: 171-181.

22. Ware JJ, Sherbourne CD. The MOS 36-item short-form health survey(SF-36). I. Conceptual framework and item selection. Med Care 1992; 30:473-483.

23. Kind P. The EuroQol instrument: an index of health-related quality of life. In: Spilker B, editor. Quality of life and Pharmaco Economics in clinical trials. 2nd ed. Philadelphia: Lippincott-Raven Publishers; 1996.

24. Rector TS, Tschumperlin LK, Kubo SH, Bank AJ, Francis GS, Mc Donald KM, et al. Use of the Living with Heart Failure questionnaire to ascertain patients' perspectives on improvement in quality of life versus risk of drug induced death. J Card Fail 1995; 1:201-206.

25. Spertus J, Peterson E, Conard MW, Heidenreich PA, Krumholz HM,Jones P, et al. Cardiovascular Outcomes Research Consortium. Monitoring clinical changes in patients with heart failure: a comparison of methods. Am Heart J 2005; 150:707-715.

26. Konstam V, Salem D, Pouleur H, Kostis J, Gorkin L, Shumaker S, et al. Baseline quality of life as a predictor of mortality and hospitalization in 5,025 patients with congestive heart failure. SOLVD Investigations. Studies of Left Ventricular Dysfunction Investigators. Am J Cardiol 1996; 78:89-105.

27. Soto GE, Jones P, Weintraub WS, Krumholz HM, Spertus JA. Prognostic value of health status in patients with heart failure after acute myocardial infarction. Circulation 2004; 110:546-551.

28. Schoen C, How SK. National scorecard on U.S. health system performance: technical report. The Commonwealth Fund, 2006

29. Roe CM, Motheral BR, Teitelbaum F, Rich MW. Angiotensin converting enzyme inhibitor compliance and dosing among patients with heart failure. Am Heart J 1999; 138:818-825.

30. Rich MW, Gray DB, Beckham, Wittenberg C, Luther P. Effect of a multidisciplinary intervention on medication compliance in elderly patients with congestive heart failure. Am J Med 1996; 101:270-276.

31. Sadik A, Yousif M, McElnay JC. Pharmaceutical care of patients with heart failure. Br J Clin Pharmacol 2005; 60:183-193.

32. Kadish A, Mehra M. Heart failure devices: implantable cardioverter defibrillators and biventricular pacing therapy. Circulation 2005;111: 3327-3335.

33. Small RS. Integrating device-based monitoring into clinical practice: insights from a large heart failure clinic. Am J Cardiol 2007;99: 17-22.

34. Stevenson LW, Desai AS. Selecting patients for discussion of the ICD as primary prevention for sudden death in heart failure. J Card Fail 2006; 12:407-412.

35. Goldenberg I, Vyas AK, Hall WJ, Moss AJ, Wang H, He H, et al. Risk stratification for primary implantation of a cardioverter-defibrillator in patients with ischemic left ventricular dysfunction. J Am Coll Cardiol 2008; 51:288-296.

36. Greenberg BH, Barnard DD. Contemporary diagnosis and management of heart failure. Newtown (PA): Handbooks in Health Care Company; 2005.

37. Koelling TM, Johnson ML, Cody RJ, Aaronson KD. Discharge education improves clinical outcomes in patients with chronic heart failure. Circulation 2005; 111:179-285.

28. Levy W, Mozaffarian D, Linker DT, Sutradhar SC, Anker SD,Cropp AB, et al. The Seattle Heart Failure Model: prediction of survival in heart failure. Circulation 2006; 113:1424-1433.

39. 2022ACC/AHA/HFSA Guideline for the management of heart failure. Journal of Cardiac Failure 2022;28;4

40. Advance care planning. http://www.ahrq.gov/ research/endliferia/endria.htm. 2007.

41. Krumholz HM, Phillips RS, Hamel MB, Teno JM, Bellamy P, Broste SK, et al. Resuscitation preferences among patients with severe congestive heart failure: results from the SUPPORT project. Circulation 1998; 98:648-655.

42. Formiga F, Chivite D, Ortega C, Casas S, Ramon JM, Pujol R. End of-life preferences in elderly patients admitted for heart failure. QJM 2004; 97:803-808.

43. McNutt RA. Shared medical decision making: problems, process, progress. JAMA 2004; 292:2516-2518.

44. Zickmund SL, Blasiole JA, Brase V, Arnold RM. Congestive heart failure patients report conflict with their physicians. J Card Fail 2006; 12:546-553.

45. Califf RM, Vidaillet H, Goldman L. Advanced congestive heart failure: what do patients want. Am Heart J 1998; 135: S320-326.

46. Allen LA, Yager JE, Funk MJ, Levy WC, Tulsky JA, Bowers MT,et al. Discordance between patient-predicted and model-predicted life expectancy among ambulatory patients with heart failure. JAMA 2008; 229:2533-2542.

47. Michalsen A, Konig G, Thimme W. Preventable causative factors leading to hospital admission with decompensated heart failure. Heart 1998;80: 437-441.

48. Bass EB, Fortin AH 4th, Morrison G, Willis S, Mumford LM,Goroll AH. National survey of clerkship directors in internal medicine on the competencies that should be addressed in the medicine core clerkship. Am J Med 1997; 102:564-571.

49. Maclure M, Nguyen A, Carney G, Dormuth C, Roelants H, Ho K, et al. Measuring prescribing improvements in pragmatic trials of educational tools for general practitioners. Basic Clin Pharmacol Toxicol 2006; 98:243-252.

50. DeLong JF, Allman RM, Sherill RG, Schiesz N. A congestive heart failure project with measured improvements in care. Eval Health Prof 1998; 21:472-486.

51. Konstam MA. Executive Council of the Heart Failure Society of America. Heart failure training: a call for an integrative, patient focused approach to an emerging cardiology subspecialty. J Am Coll Cardiol 2004; 44:1361-1362.

52. Thomson O'Brien MA, Freemantle N, Oxman AD, Wolf F, Davis DA, Herrin J. Continuing education meetings and workshops: effects on professional practice and health care outcomes. Cochrane Database Syst Rev 2001;(2): CD003030.

53. Donabedian A. Twenty years of research on the quality of medical care: 1964-1984. Eval Health Prof 1985; 8:243-265.

54. Krumholz HM, Wang Y, Mattera JA, Wang Y, Han LF, Ingber MJ, et al. An administrative claims model suitable for profiling hospital performance based on 30-day mortality rates among patients with heart failure. Circulation 2006; 113:1693-1701.

55. Bonow RO, Bennett S, Casey DE Jr, Ganiats TG, Hlatky MA, Konstam MA, et al. American College of Cardiology; American Heart Association Task Force on Performance Measures; Heart Failure

Society of America. ACC/AHA clinical performance measures for adults with chronic heart failure: a report of the American College of Cardiology/American Heart Association Task Force on Performance Measures (Writing Committee to Develop Heart Failure Clinical Performance Measures): endorsed by the Heart Failure Society of America. Circulation 2005; 112:1853-1887.