

CONGESTIVE HEART FAILURE

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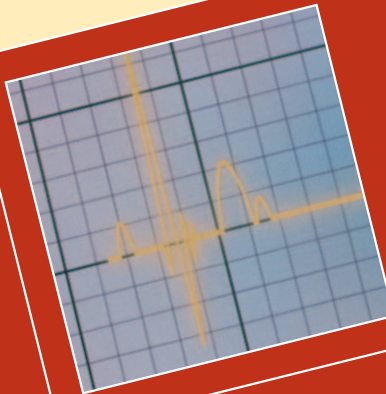
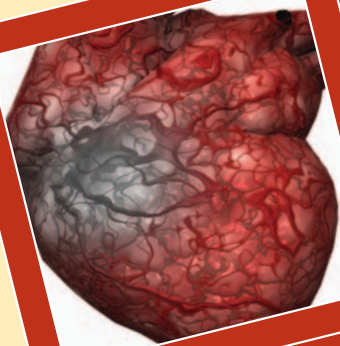
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Introduction and Scope

Nearly five million Americans currently live with congestive heart failure (CHF) and approximately 550,000 new cases are diagnosed in the U.S. each year according to statistical data from the Centers for Disease Control and Prevention (CDC). It is responsible for 11 million physician visits annually, and more hospitalizations than all forms of cancer combined. CHF is the primary diagnosis in 875,000 hospitalizations per year, and the most common diagnosis in hospital patients age 65 years and older. In that over-65 age group, one-fifth of all hospitalizations have a primary or secondary diagnosis of heart failure (HF).

The incidence of CHF is equally frequent in men and women, however, African-Americans are 1.5 times more likely to develop heart failure than Caucasians. More than half of those who develop CHF die within five years of diagnosis, and the diagnosis contributes to approximately 287,000 deaths a year in the U.S. It is also important for healthcare teams to understand that sudden death is common in patients with CHF, occurring at a rate of six to nine times that of the general population. It is estimated that beyond costs in length of life and disability, the total monetary costs, including indirect costs for HF, will increase from \$31 billion in 2012 to \$70 billion in 2030. If one assumes all costs of cardiac care for HF patients are attributable to HF (no cost attribution to comorbid conditions), the 2030 projected cost estimates of treating patients with HF will be three-fold higher (\$160 billion in direct costs).¹

Heart failure tends to have several antecedent risk factors. The American Heart Association (AHA)/American College of Cardiology Foundation (ACCF) Heart Failure Guidelines now classify people possessing many of these risk factors as having “Stage A” heart failure. The most common risk factors that are implicated are hypertension (HTN), coronary artery disease (CAD), myocardial infarction (MI), diabetes mellitus (DM), some diabetes medications such as rosiglitazone and pioglitazone, sleep apnea, congenital heart disease (CHD), valvular heart disease (VHD), certain viral infections such as human immunodeficiency virus (HIV), alcohol use, tobacco use, obesity and tachyarrhythmias such as atrial fibrillation (AF).

With improving therapies and risk factor interventions, deaths from heart failure have decreased on average by 12 percent per decade for women and men over the past 50 years. Unfortunately, despite evidence-based guideline utilization, the likelihood of morbidity and re-hospitalization remain high. Re-hospitalization rates in the U.S., on average, approach 25 percent of patients within 30 days of discharge and by six months, this proportion reaches nearly 50 percent.^{2,3} Some of these are related to the primary disease process, but nearly one-half to two-thirds of these readmissions appear to be triggered by potentially remediable factors, including poor discharge planning, nonadherence to recommendations regarding diet and medical treatment, inadequate follow-up, poor social supports and delays in seeking medical attention.⁴⁻⁶

Since 2012, the Centers for Medicare & Medicaid Services (CMS) has begun penalizing hospitals for what it has defined as an “excess readmission ratio.” This has placed further burdens on hospital systems as the rate at which hospitals are penalized will be an increasing incremental total rate over a period of time if they fail to achieve certain readmission metrics over the years (<http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html>).

Given the confluence of epidemiology, cost implications, availability of established guidelines and effective treatments, as well as observed variability in hospital clinical practice and transitional care practices, CHF represents a high-impact target for inpatient quality improvement (QI) initiatives. There are multiple factors that must be considered in inpatient care as well as the “hospital to home” transition to effectively improve the outcomes and readmission rates in this patient population.⁷ It has generally been noted that a single process intervention is not likely to be effective, and a more comprehensive approach is necessary to affect outcomes.⁸

Optimizing HF care during and after hospital admission episodes will benefit both patients and healthcare delivery systems.

Step 1: Form an Interdisciplinary Team with a Common Goal

Step 1: Form an Interdisciplinary Team with a Common Goal

When instituting a program to provide evidence-based heart failure (HF) care at your institution, an initial step should be the formation of an interdisciplinary team to measure current processes, analyze baseline data, and design and deploy improvement interventions. To develop or extend a HF quality improvement (QI) program, it is critical to have representation from a diverse group of hospital constituents. These members may include, but are not limited to, hospital leadership (both clinical and administrative), frontline practicing hospitalists, cardiologists, emergency medicine physicians, cardiothoracic (CT) surgeons, ambulatory care physicians, advanced practice providers (APPs), pharmacists, nurses, social workers, case managers, nutritional services, discharge advocates, home health/nursing facilities staff, information technology (IT) employees and clerical staff. The perspectives that different stakeholders bring to the program are unique and will lead to a more robust solution.

1.1 Quality Improvement Team Composition

A formal structure to the QI team will help to delineate roles in the improvement process. Responsibilities should be established at the start of the project. An example of team organization is provided below. In many hospital settings there will be overlap between these roles. The important concept is to have the different functions and responsibilities embedded into the team.

1) Executive Sponsor (“The Bigwig”)

The executive sponsor is a member of senior management who provides overall guidance and accountability for the project. For example, this could be the chairman of medicine, the vice president of medical affairs (VPMA), the chief medical officer (CMO) or the chief quality officer (CQO) of your institution. This individual approves the QI team recommendations, ensures timely implementation, secures any necessary financial support, removes organizational barriers to project success and helps ensure that the project has sustained results. This senior leader can provide the leverage necessary to secure the resources essential for success. For example, your project may involve the implementation of a standardized, mandated order set for HF patients, but the IT department may have a backlog of requests to change the electronic medical record (EMR). The executive sponsor, in this situation, can provide the influence to ensure your project receives the necessary priority from the IT department.

2) Project Sponsor (“The High-Level Advocate”)

The project sponsor facilitates the timely and successful implementation of the project. This person has close contact and meets frequently with the project leader. The project sponsor reviews progress, and may be a key decision-maker for approval of final recommendations. This individual could be the hospital medicine practice director, a leader in an academic division or someone with similar oversight responsibility, and will have a detailed understanding of QI strategies and familiarity with HF clinical workflows and practice standards. Depending on organizational factors (size, governance structure, etc.), the project sponsor function may be encompassed within either the executive sponsor or the project leader roles.

Step 1: Form an Interdisciplinary Team with a Common Goal

3) Project Leader (“The Main Nuts-and-Bolts Person”)

The project leader is the day-to-day manager of the initiative and completes all deliverables in a timely manner. This person would typically be a frontline practitioner extending his or her scope of activity into the QI area. Key responsibilities include coordinating project team activity (including communications of project status to all levels of the QI team) and ensuring that all project goals are met on time and on budget. From a practical standpoint, the project leader will have the most direct impact on project success, and as such, the role can require a significant investment of time and effort. Accordingly, it is recommended that the project leader have some portion of protected time away from his or her other responsibilities to meaningfully engage in the role.

4) QI Facilitator (“The Data Guru”)

The QI facilitator has access to the data needed to measure the baseline metrics, as well as to track progress. Often this is a person working in the hospital’s QI department who is trained in data management, basic analysis and supporting process improvement projects. These individuals will generally be comfortable with the use of data storage and statistical software packages.

5) Process Owners (“Those on the Front Lines”)

The process owners are the frontline personnel involved in the process of providing care and case coordination to HF patients in the hospital. Examples include practicing hospitalists not directly leading the project, pharmacists, nursing staff, social workers and case managers. For HF projects, transitional care is key, so process owners from home health, nursing facilities and ambulatory medicine will need to be involved. Their input on existing workflows and ways in which care processes can be redesigned will be a critical component in the improvement process. In addition, “frontline members” on the QI team can help to achieve the necessary “buy-in” from the diverse constituencies present in the hospital.

6) IT Liaison (“The Computer Guy”)

The IT liaison is crucial in EMR-based environments to implement the necessary changes in ordering and documentation associated with the QI program. Some examples of the IT liaison’s functions include modifying current order sets, instituting electronic alerts, coding rules within the EMR environment to achieve your project goals, developing IT-based training models and trouble-shooting IT-related data from the EMR.

1.2 Create a Shared Need for a Quality Improvement Program

A key phase for performance improvement success centers on creating a common vision of program value. If buy-in to the change effort is low, the program will not be successful. Developing awareness of a shared need forces any resistance or apathy to be addressed upfront, builds momentum to get the performance improvement program launched and validates the program’s importance. The need for change can be framed both as a threat (e.g., implications of HF-related readmissions) and an opportunity (e.g., the potential to promote patient-centered care through the reduction of symptoms, functional disability and readmissions).






Step 1: Form an Interdisciplinary Team with a Common Goal

Stakeholders (considered here to be people or groups who have a vested interest in improving the current processes) can influence program success. Analysis of stakeholder positions will allow formulation of strategies on how to best initiate change.

One stepwise method of performing a stakeholder analysis is presented below (with an accompanying example in Figure 1):

1. List key stakeholders by name and assess their current beliefs regarding the change process.
2. For each individual, plot both the current state of belief regarding the change process ("X" in Figure 1) and the minimum level of support for the change required from the individual for program success ("Y" in Figure 1).
3. Identify gaps between current and desired states.
4. Plan action steps for closing any perceived gaps with influence strategy and coaching.

Figure 1: Example of Stakeholder Analysis Method

Role	Against Change	Moderately Against Change	Neutral to Change	Moderately Supportive of Change	Strongly Supportive of Change
Pharmacy Budget Director	X  Y				
PCP	X  Y				
Hospitalist	X  Y				
VPMA, CMO	X  Y				
Cardiologist	X  Y				

See Appendix A: Obtaining Institutional Support

See Appendix B: Stakeholder/Committee/Special Group Reporting and Approval Process

See Appendix C: Heart Failure Improvement Team Roster

See Appendix D: Establishing Team Rules

See Appendix E: Establish General Aims

Step 2: Obtain Institutional Support

Step 2: Obtain Institutional Support

Institutional support (at multiple levels) is critical to QI project success as it provides access to the resources required to change current hospital culture and practices. QI efforts should align with the hospital's mission and vision while addressing issues identified as care delivery and operational priorities. The clinical rationale for improving hospital-based management of HF was presented in this *Guide's* Introduction. A compelling business case likewise exists, based on the increasing prevalence of this condition and the high costs of care associated with its preventable sequelae. Both rationales can be employed to obtain “buy-in” of the hospital's senior leadership. Gaining this high-level endorsement will help garner the core components needed for a successful QI initiative (status as something important to do, personnel, IT assistance, etc.).

2.1 Heart Failure as a Healthcare Quality Issue That Impacts Hospital Reimbursement

Over the past decade, market forces, healthcare legislation and conceptual shifts regarding the need for systematic approaches to healthcare improvement have spurred healthcare delivery organizations to view the provision of care through a new lens. The Patient Protection and Affordable Care Act (commonly called the Affordable Care Act, or ACA) increased monetary drivers for improved quality by placing more dollars “at risk” according to outcomes, and the movement toward accountable care organizations (with bundled payments) will accelerate the need to manage patients longitudinally across a continuum, rather than in “siloes” episodes of care.

Measures in the Centers for Medicare & Medicaid Services' (CMS') Hospital Value-Based Purchasing (HVBP) Program specifically address HF as it is the most common diagnosis for admission for patients over the age of 65 and is increasingly affecting those in lower age demographics. More details about HVBP are available at:

<http://www.qualitynet.org/dcs/ContentServer?cid=1228773024772&pagename=QnetPublic%2FPage%2FQnetTier4&c=Page>.

Measures in the Hospital Inpatient Quality Reporting (Hospital IQR) Program directly address HF. Participation in the Hospital IQR Program is required in order to receive annual payment updates from CMS. Details about IQR are available at:

<http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier3&cid=1163010421830>.

Six specific examples of HF and Quality Reporting, performance and financial incentives are described below:

2.1.1 Outcome Measures: 30-day All-Cause Mortality and Readmission Rate

Hospital performance metrics have gradually moved from process measures to a heightened emphasis on outcomes measures with two of the most important being 30-day mortality and 30-day all-cause readmissions.

In Fiscal Year (FY) 2014, the HVBP Programs included 30-day all-cause mortality rates for acute myocardial infarction (AMI), heart failure (HF) and pneumonia (PNA) as components of hospital quality assessments. Performance in these areas will impact receipt of incentive payments or payment reductions.

Step 2: Obtain Institutional Support

Under Medicare's Inpatient Prospective Payment System (IPPS), as included in the ACA, adjustments to payments made for excessive readmissions in acute care hospitals during fiscal years began on October 1, 2012. The ACA focused initially on these three conditions and the readmission rates attributed to them. In FY 2015, the policy expanded to include chronic obstructive pulmonary disease (COPD), coronary artery bypass grafting (CABG), percutaneous transluminal coronary angioplasty (PTCA) and other vascular conditions as index admission diagnoses subject to the 30-day all-cause re-hospitalization parameter. Also beginning in 2015, patients who require higher levels of care within 30 days of discharge from one of these conditions, including the need for an Emergency Department visit or an "Observation" stay, will be counted as a "readmission" as it pertains to penalty assessments to hospitals. It is expected that this list will include additional diagnoses in coming years.

HF is a common confounding comorbidity with each of these conditions (AMI, PNA, COPD, CABG and PTCA) and therefore is a high-impact area for which hospitals to focus energies. Additionally, patients with HF not uncommonly have a higher frailty index, which places them at an even higher risk of morbidity and readmissions.⁹ This highlights the need for a highly coordinated approach between the inpatient and the ambulatory care arenas in order to facilitate safe transitions in care to this particularly at-risk population. Hospitals performing worse in these areas relative to their peers will suffer financial penalties from CMS (<http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html>).

2.1.2 Structural Measures: Federal Claims-Based Database Registry

Medicare Part A claims data, also known as MedPAR or inpatient standard analytic files, are one of the most readily available and widely used sources of data on hospitalizations in the United States. All U.S. adults aged 65 and older who have paid Social Security payroll taxes for at least 10 years or who were the spouse of such a worker are eligible for Medicare Part A, as well as those who are permanently disabled or have end-stage renal disease (ESRD) or amyotrophic lateral sclerosis (ALS). Medicare claims data are particularly useful because they are nationally representative and longitudinal for all enrollees in the traditional Medicare fee-for-service program, representing about 35 million beneficiaries.

Clinical data on Medicare hospital claims are limited to 10 diagnoses and six procedure codes, as defined by the International Classification of Diseases, 9th Revision-Clinical Modification (ICD-9-CM). Beginning October 1, 2015, the ICD-10 took effect. The first or "principal" diagnosis is the reason determined at discharge as the main reason for a patient's admission to the hospital. Medicare Part A claims also include patients' Medicare identification number, a hospital identifier and basic demographic data including age, sex and race. Strengths of Medicare Part A data for chronic disease surveillance include the ability to link hospitalizations longitudinally for individual patients and to link to Medicare Part B data to assess physicians' services and ambulatory care before and after hospitalizations. Limitations of Medicare data for monitoring cardiovascular and pulmonary hospitalizations include the very limited data on patients under age 65 (i.e., only those with permanent disabilities, ESRD or ALS) and the lack of data on patients enrolled in private health plans through the Medicare managed-care program known as Medicare Advantage. With the growing need for data to evaluate health system performance and public health policy, a number of states are developing all-payer claims databases.

Although administrative claims data are useful at the macro level to describe patterns of use and mortality, a number of limitations are inherent in the use of administrative data that need to be considered in the interpretation and use of these data. These limitations include coding errors, limited clinical information and diagnostic misclassification, which include under-diagnosis, over-diagnosis and misdiagnosis common for cardiovascular and chronic lung diseases.

Step 2: Obtain Institutional Support

Although the specificity of diagnostic algorithms shows promise for selected applications, their sensitivity and positive predictive value may be low. Moreover, variations in patterns of diagnostic practices may further bias claims data.¹⁰

This claims-based data is important to review to assess the current state of an institution's performance with reported metrics and outcomes. This MedPAR data serves as the basis for CMS incentivized payments and penalties, so it will be important to understand who is responsible for inputting the data and to understand how this data is gathered. Institutions have been able to use an audit of this data to find both reporting errors as well as opportunities to improve documentation and coding practices within a facility.

2.1.3 American Heart Association Get With The Guidelines®-Heart Failure

Get With The Guidelines®-Heart Failure is an in-hospital program for improving care by promoting consistent adherence to the latest scientific treatment guidelines and a registry to allow comparison and collaboration with peers from other institutions. Successful participation of hospitals also allows for national reward recognition and marketing opportunities. Numerous published studies demonstrate the program's success in achieving significant patient outcome improvements. Among the proven results are reductions in 30-day readmissions.^{11,12}

Get With The Guidelines®-Heart Failure:

http://www.heart.org/HEARTORG/HealthcareResearch/GetWithTheGuidelines/GetWithTheGuidelines-HF/Get-With-The-Guidelines-Heart-Failure-Home-Page_UCM_306087_SubHomePage.jsp

American Heart Association: HF Strategies and Clinical Tools:

http://www.heart.org/HEARTORG/HealthcareResearch/TargetHFStroke/TargetHF/Target-HF-Strategies-and-Clinical-Tools_UCM_432444_Article.jsp

2.1.4 American College of Cardiology Hospital to Home Initiative

The Hospital to Home (H2H) national quality improvement initiative (<http://cvquality.acc.org/Initiatives/H2H.aspx>) is an effort to reduce cardiovascular-related hospital readmissions and improve the transition from inpatient to patient status for individuals hospitalized with cardiovascular disease. Rather than imposing and advocating specific strategies, the H2H project provides a central clearinghouse of information and tools, building on what others are doing and have done to improve care transitions and reduce readmissions. H2H focuses on three evidence-based areas for improvement: 1) Early Follow-up; 2) Post-discharge Medication Management; 3) Signs and Symptoms.

This program aims to help organizations streamline hospital QI efforts, identify more efficient uses of technology (i.e., health information technology [HIT]), funnel limited resources into areas of greatest need thereby increasing return on investment (ROI) and decrease penalties to the hospital while strengthening financial baseline of the institutions. It also focuses on helping hospital staff grow QI expertise, increase opportunities for staff cross-training, energize staff to address QI opportunities in innovative ways, engage staff as solvers/solution focused rather than problem-oriented and more efficiently work in multidisciplinary teams.

Step 2: Obtain Institutional Support

2.1.5 American College of Cardiology Patient Navigator Program

The American College of Cardiology (ACC) launched the Patient Navigator Program (<http://cvquality.acc.org/Initiatives/Patient-Navigator.aspx>) in 2014 to apply a team-based approach for keeping patients at home and healthy after hospital discharge. Hospitals that participate in the ACC's NCDR[®] ACTION Registry[®]-GWTGTM and the H2H initiative are eligible to participate. The program combines the power of the registry's infrastructure with the improvement strategies used in H2H. With the ACC Patient Navigator Program, hospitals will be supported in developing new or in enhancing existing processes to reduce readmissions and improve overall patient care. Participating hospitals are given funding to establish a program that supports a culture of patient-centered care that can potentially be implemented in other hospitals in the future. For hospitals that are accepted into the program, the ACC will provide onsite training, tools, online self-assessments and webinars in a structured framework. Participating hospitals are required to report back to the ACC on specific program metrics. Participants will have the opportunity to be recognized for their efforts by "Sharing their Story" via ACC communication channels.

2.1.6 Physician Quality Reporting System

The national Physician Quality Reporting System (PQRS), formerly known as the Physician Quality Reporting Initiative (PQRI) (https://www.pqrspro.com/cmsgroups/2015/heart_failure), has been using incentive payments and will begin to use payment adjustments (penalties/reductions) in 2015, to encourage healthcare professionals to report on specific quality measures. The CMS-based initiative has six endorsed measures pertaining to HF. The measures are:

1. PQRS Measure #5:

Heart Failure: Angiotensin-converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)

Which measures the percentage of patients aged 18 years and older with a diagnosis of heart failure (HF) with a current or prior left ventricular ejection fraction (LVEF) <40% who were prescribed ACE inhibitor or ARB therapy either within a 12 month period when seen in the outpatient setting OR at each hospital discharge.

2. PQRS Measure #8:

Heart Failure: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)

Which measures the percentage of patients aged 18 years and older with a diagnosis of heart failure (HF) with a current or prior left ventricular ejection fraction (LVEF) <40% who were prescribed beta-blocker therapy either within a 12 month period when seen in the outpatient setting OR at each hospital discharge.

3. PQRS Measure # 47:

Care Plan

Which measures the percentage of patients aged 65 years and older who have an advance care plan or surrogate decision maker documented in the medical record or documentation in the medical record that an advance care plan was discussed but the patient did not wish or was not able to name a surrogate decision maker or provide an advance care plan.

Step 2: Obtain Institutional Support

4. PQRS Measure #110:

Preventive Care and Screening: Influenza Immunization

Which measures the percentage of patients aged six months and older seen for a visit between October 1 and March 31 who received an influenza immunization OR who reported previous receipt of an influenza immunization.

5. PQRS Measure #130:

Documentation of Current Medications in the Medical Record

Which measures the percentage of visits for patients aged 18 years and older for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter.

6. PQRS Measure #226:

Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention

Which measures the percentage of patients aged 18 years and older who were screened for tobacco use one or more times within 24 months AND who received cessation counseling intervention if identified as a tobacco user.

Currently, physicians may qualify for bonus dollars from CMS if performance targets are met. Beginning in 2015, there is a downward payment adjustment for eligible professionals who do not satisfactorily report data for covered professional services.

Positioning HF management as an issue that affects hospital reimbursement by highlighting these programs to senior leadership will help prioritize your HF QI project as an objective warranting institutional support.

Step 3: Assess the Current State of Heart Failure Care in Your Facility

Step 3: Assess the Current State of Heart Failure Care in Your Facility

3.1 Create a High-Level Process Map

Summarizing the key steps in a care delivery process is essential to understanding the scope of the QI project and identifying specific targets for improvement. This *Guide* is focused on improving HF outcomes, however, the process map will allow you to locate specific target areas (leverage points) where the QI intervention(s) may be able to improve adherence to performance metrics, reduce readmission rates and improve provider and patient satisfaction in the care delivery process. Ideally, the collective expertise of the project team is utilized to create these high-level process maps by:

- Defining the major function (output) of the process
- Identifying all participants (e.g., admitting hospitalist, rounding hospitalist, nurses, pharmacists, etc.)
- Delineating beginning and ending points
- Brainstorming on critical steps and determining the process sequence
- Validating workflow by “test driving” the process

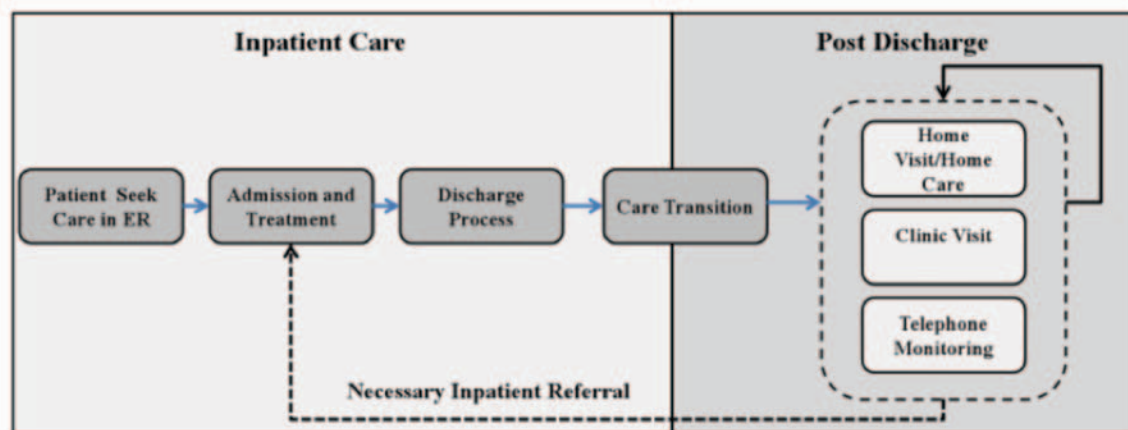
An example of a high-level process map focusing on patients with HF is provided in Figure 2.

Given the complexity of the management of the HF patient and the many points in care where errors/omissions may be introduced into the system, it would be beneficial for high-level maps to be developed for each phase of care:

- 1) Admission
- 2) Hospital Course
- 3) Discharge Management
- 4) Transition of Care to Nursing Home, Home Health, Ambulatory Clinic, etc.

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Figure 2: High-Level Process Map Focusing on Patients with HF



(Wu S, Liu P, Belson D. Multiple-hospital lean initiative to improve congestive heart failure care: a mixed-methods evaluation. *Journal of the Society for Healthcare Improvement Professionals*. Oct. 2013 Vol 3. <http://www.jship.org/articles/vol-3-articles-october-2013/multiple-hospital-lean-initiative-to-improve-congestive-heart-failure-care-a-mixed-methods-evaluation-2/>.)

3.2 Determine Heart Failure Case Volume and Prioritize Hospital Unit Locations

The objective here is to get an estimate of the HF population size within your facility, and determine where these patients receive their care to allow you to focus on a particular geographic area to start your HF QI project. This information will generally be available in administrative datasets. An example of data extraction specifications for this step, as well as the results of applying those specifications to a 500-bed tertiary hospital, is provided in Table 1. From within the medical record, the following data points could be extracted:

- Time Period Between January 1, 2014 – December 31, 2014
- Admission Status: Inpatient or Observation
- HF ICD-10 Codes
- Hospital Unit Location at Time of Discharge (discharge rather than admission unit selected to capture where care transition planning would usually occur)

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Table 1: Example of HF Case Volume and Hospital Unit Distribution at Discharge

Discharge Unit	Total # of CHF Cases	% Total of Cases
4-North	316	23.2
4-South	283	20.8
6-North	223	16.4
8-North	118	8.7
7-North	91	6.7
7-South	64	4.7
STC-4	56	4.1
STC-5	53	3.9
6-South	33	2.4
MICU	29	2.1
5-North	26	1.9
STC-2	20	1.5
5-South	18	1.3
CCU	18	1.3
6 other units	14	<1 % per unit
Total	1362	100%

Table 1 indicates that HF cases are found throughout the hospital, but more than 60 percent are clustered within four units. These units would be a logical choice to launch a HF QI program, which could then be disseminated to other floors over time.

Ultimately, the goal would be to have the improvement interventions related to a HF diagnosis alone rather than incorporating geographic location. However, if resources are limited or the hospital is large, starting a project as a localized pilot on a specific unit with high case prevalence represents a useful approach to move past scale-related organizational barriers commonly encountered in the enterprise-wide initiatives.

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3.3 Conduct Environmental Scan for Existing Hospital Heart Failure Resources

The aim here is to identify components within your facility that may be readily integrated into the QI project, as well as to avoid duplication of effort. Some examples include:

- Clinical decision support (CDS) tools embedded into paper documents or electronic health records: These could relate to best practice pathways, standardized HF order sets, etc. CDS tools that are “hardwired” into hospital workflow (as opposed to external applications available on the Web or individual mobile devices) are particularly helpful.
- High-Risk Pharmacy Teams: Some hospitals deploy pharmacist-led teams to monitor and optimize patients with complex pharmacological regimens, or clinical diagnoses that are considered high risk for morbidity and mortality. This model has also been used successfully in the geriatric population of patients.¹³
- Active and historical QI projects overlapping with HF: These can be referenced and used in your QI project.

3.4 Determine Data Extraction and Management Capabilities

Most hospital facilities fall somewhere within the spectrum of a fully leveraged EMR and a purely paper-based workflow. For purposes of an HF QI project, some of the key data management issues to examine include:

- Are current data systems able to identify HF cases in real-time and retrospectively?
- Can the data elements be obtained electronically, or is manual review required?
- Can QI team members access and manage project data, or is additional help needed?

3.5 Determine Baseline Performance

Step 5 further details potential outcome measures for a HF QI project, with additional information on suggested data collection strategies. Whatever metrics are chosen, obtaining current performance prior to QI project initiation is essential, as it will both help confirm whether the proposed metrics are appropriate and assist with setting performance targets. For a common condition such as HF, looking at a small random sample of cases over a defined period of time (e.g., 30-day readmission of patients with a HF diagnosis) can usually be obtained from administrative data.

Three time points during a hospital episode provide a good substrate for a HF QI program: admission, intervening hospital days and discharge transitions. Figure 3 provides an example of how baseline data could be collected in the starting phases of an initiative with a minimal commitment of resources (e.g., 10 minutes a chart).

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Figure 3: Example of a Structured Baseline Data Collection Process for AF QI

Source	Data Extracted
Administrative Data	Random sample of cases with discharge diagnosis codes of: ICD-10: 150.xx
Admit	Was HF pre-existing or a new diagnosis? If existing, was the patient being adherent to sodium intake and medication recommendations? If home med, was dosage altered or continued on admission? If not continued, was there a clinical reason? If new diagnosis, was guideline-recommended therapy ordered at admission? If not ordered, was there a valid clinical reason?
Admission H&P Admission Orders	
Interim Stay	Were socio-economic barriers to therapeutic adherence documented? Was guideline-recommended therapy ordered during the hospital course? If not ordered, was there a clinical reason?
Daily Progress Notes Medication Orders	
Discharge Transition	Was education regarding importance of adherence to dietary and pharmacological adherence documented and discussed? Were guideline-recommended therapies ordered with discharged meds? If not ordered, was a clinical reason documented? Were there instructions provided regarding signs and symptoms for patient to watch for? Were barriers to patient adherence discussed, documented and planned for?
Discharge Summary Discharge Medication List Discharge Instructions	

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4.1 Tools to Assess Heart Failure Mortality Risk

Outcomes in heart failure are highly variable, with annual mortality varying from 5 percent to 75 percent. Physicians need to counsel patients about prognosis to enable informed decisions about medications, devices, transplantation and end-of-life care.

4.1.1 Seattle Heart Failure Score

The Seattle Heart Failure Model (SHFM) (<https://depts.washington.edu/shfm/>) is a calculator of projected survival at baseline and after interventions for patients with heart failure. SHFM is designed for use by healthcare providers knowledgeable in cardiac medicine.

The Seattle Heart Failure Risk Calc (<https://itunes.apple.com/us/app/seattle-heart-failure-risk/id380414129?mt=8>) is developed based on the SHFM and provides fairly accurate estimations of one-, two- and five-year survival rates for patients with heart failure. In patients with advanced HF, the SHFM offers adequate discrimination, but absolute risk is underestimated, especially in African-Americans and in patients with devices. This is more prominent when including transplantation and left ventricle assist device (LVAD) implantation as an end point.^{14,15}

4.1.2 MAGGIC Risk Score

The MAGGIC (Meta-Analysis Global Group in Chronic Heart Failure) (<http://www.heartfailurerisk.org/#>) risk score is a simple yet powerful method of risk stratification for both morbidity and mortality in heart failure with preserved ejection fraction (HFpEF). The Heart Failure Risk Calculator was developed by using a large international database from multiple cohort studies. The aim is to create a generalizable easily used risk score for mortality in patients with HF. The intended audience for the Risk Calculator is healthcare professionals knowledgeable in cardiology and the management of people with heart failure.¹⁶

4.1.3 INTERMACS Risk Score

The INTERMACS (Interagency Registry for Mechanically Assisted Circulatory Support) scale classifies advanced heart failure patients according to hemodynamic status and predicts outcomes in advanced heart failure patients undergoing mechanical circulatory support (MCS). The INTERMACS scale (see Table 2) can be useful to stratify the postoperative prognosis of patients with advanced HF that receive urgent heart transplant (HT). This scale can be utilized in the selection of candidates for urgent HT and the distribution of heart donors in the field, and therefore could be incorporated into the habitual clinical practice of professionals in this field.¹⁷

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Table 2. INTERMACS Scale for Classifying Patients With Advanced Heart Failure.

Profiles	Definition	Description
INTERMACS 1	<i>“Crash and burn”</i>	Hemodynamic instability in spite of increasing doses of catecholamines and/or mechanical circulatory support with critical hypoperfusion of target organs (severe cardiogenic shock)
INTERMACS 2	<i>“Sliding on inotropes”</i>	Intravenous inotropic support with acceptable blood pressure but rapid deterioration of kidney function, nutritional state, or signs of congestion
INTERMACS 3	<i>“Dependent stability”</i>	Hemodynamic stability with low or intermediate, but necessary due to hypotension, doses of inotropics, worsening of symptoms, or progressive kidney failure
INTERMACS 4	<i>“Frequent flyer”</i>	Temporary cessation of inotropic treatment is possible, but the patient presents frequent symptom recurrences and typically with fluid overload
INTERMACS 5	<i>“Housebound”</i>	Complete cessation of physical activity, stable at rest, but frequently with moderate water retention and some level of kidney dysfunction
INTERMACS 6	<i>“Walking wounded”</i>	Minor limitation on physical activity and absence of congestion while at rest. Easily fatigued by light activity
INTERMACS 7	<i>“Placeholder”</i>	Patient in NYHA functional class II or III with no current or recent unstable water balance

Click on the following link to view the INTERMACS® Patient Assessment Worksheet to view the Level of Limitation at time of Implement, located on page 2:

http://www.heartware.com/sites/default/files/uploads/resources/gl1006_patientassessmentworksheet_rev01.pdf.

(Stewart GC, Teuteberg JJ, Kittleson M, Cowger J, Patel C, Johnson F, Stevenson LW. INTERMACS profiling identifies risk of death or VAD among medically-managed advanced heart failure patients. *J Heart Lung Transplant*. April 2013;32(4):S133.)

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4.1.4 ADHERE Risk Score

ADHERE Risk Score is a practical bedside tool for risk stratification for hospitalized patients with acute decompensated heart failure (ADHF). The risk score is developed to estimate mortality in patients hospitalized with ADHF. Multivariate logistic regression identified blood urea nitrogen (BUN) level, systolic blood pressure (SBP), heart rate and age as the most significant mortality risk predictors.¹⁸

4.2 Tools to Assess Heart Failure Readmission Risk

4.2.1 CORE Heart Failure Readmission Risk Score

The CORE (Center for Outcomes Research and Evaluation) Heart Failure Readmission Risk Score predicts a patient's likelihood of hospital readmission within 30 days of discharge. These calculators estimate risk of readmission based on a patient's demographic and clinical characteristics, and are based on medical record chart models developed for CMS to validate the publicly reported readmission measure for each condition.¹⁹ The app is available as a free download from the App StoreSM:

<https://itunes.apple.com/us/app/core-readmission-risk-calculators/id507579947?mt=8;>

http://www.readmissionscore.org/heart_failure.php.

4.2.2 Heart Failure Readmission Risk Score

Heart Failure Readmission Risk Score is developed as a convenient and inexpensive method for identifying an individual's risk for hospital readmission for congestive heart failure (CHF) using information derived exclusively from administrative data sources and available at the time of an index hospital discharge.²⁰ Click on the following link to view the tool:

http://www.readmissionscore.org/heart_failure.php.

4.2.3 LACE Readmit Score

The LACE readmit score has been used to predict the risk of unplanned readmission within 30 days after hospital discharge in both medical and surgical patients. This index is also validated for the accuracy of use in CHF patients. The LACE high-risk index may have utility as a screening tool to predict high-risk emergency department (ED) revisits after hospital discharge.

LACE Index scores for every patient on admission and discharge on the following parameters:

- Length of Stay
- Acuity of the Admission
- Comorbidities
- ED Visits in the Previous Six Months

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LACE scores range from 1–19 and predict the rate of readmission or death within 30 days. A LACE score of >10 at discharge identifies patients with high probability of readmission. This score helps the inpatient team (e.g., hospitalist, case management) to initiate/optimize the discharge planning process. Patients with a LACE score of 13 (predicted readmission rate 19-43 percent) may benefit from the term complex case management, Medical Home and other individualized programs.^{21,22} Click on the following link to view the tool:

<https://itunes.apple.com/us/app/readmission-risk-calculator/id452655749?mt=8>.

LACE index scoring tool online: qio.ipro.org/wp-content/uploads/2013/01/LACE_toolNEW.doc.

4.2.4 Hansan Readmit Score

The Hansan Readmit Score was developed to identify the predictors of early hospital readmission in a diverse patient population and to derive and validate a simple model for identifying patients at high readmission risk.²³

4.2.5 PARR Readmit Score

The PARR Readmit Score designed an algorithm for identifying inpatients at high risk of readmission to a National Health Service (NHS) hospital in England within 30 days of discharge and uses information that can either be obtained from hospital information systems or from the patient and their notes.²⁴ The algorithm assigns patients a risk score ranging from zero to 100 based on 21 variables, which include age, gender, ethnicity, number of previous admissions and clinical condition.

Click the following link to download the PARR30 app:

<http://developer.nhs.uk/downloads-data/parr30-app/>.

4.2.6 Heart Failure with Preserved Ejection Fraction (HFpEF)

Roughly half of all heart failure patients suffer from heart failure with preserved ejection fraction (HFpEF). HFpEF is presumed to be present in patients meeting the following criteria:

- Clinical signs and symptoms of heart failure
- Evidence of preserved or normal left ventricular ejection fraction (LVEF) (≥ 50 percent)
- Evidence of abnormal LV diastolic dysfunction via Doppler echocardiography or cardiac catheterization^{25,26}

As the U.S. population ages, HFpEF is projected to become the prominent form of HF. Despite the clinical advances seen in patients suffering from heart failure with reduced ejection fraction (HFrEF), the trials performed in patients with HFpEF have yielded mostly neutral results.²⁷ Therefore the Class I recommendations in patients suffering from HFpEF primarily focus on symptomatic relief and prevention. They include blood pressure control in accordance with published clinical practice guidelines to improve morbidity and diuretic usage to diminish the symptoms caused by edema.²⁵

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4.3 Definitions of Heart Failure Class and Stage

Table 3. Comparison of ACCF/AHA Stages of HF and NYHA Functional Classifications

Comparison of ACCF/AHA Stages of HF and NYHA Functional Classifications			
ACCF/AHA Stages of HF		NYHA Functional Classification	
A	At high risk for HF but without structural heart disease or symptoms of heart failure	None	
B	Structural heart disease but without signs or symptoms of HF	I	No limitation of physical activity. Ordinary physical activity does not cause symptoms of HF.
C	Structural heart disease with prior or current symptoms of HF	II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in symptoms of HF.
		III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity causes symptoms of HF.
		IV	Unable to carry on any physical activity without symptoms of HF, or symptoms of HF at rest.
D	Refractory HF requiring specialized interventions		

(Adapted from Yancy CW et al. 2013 ACCF/AHA Guideline for the Management of Heart Failure. *Circulation*. 2013;128:e240-e327.)

4.4 Heart Failure Guideline-Based Pharmacologic Treatment by Heart Failure Class and Stage

Visit the 2013 ACCF/AHA Guideline for the Management of Heart Failure Figure 1 on Stage C HFrEF and Figure 2 Indications for CRT therapy algorithm at: <http://content.onlinejacc.org/article.aspx?articleid=1695825>.

4.4.1 Dietary Intervention

Although the practice of sodium restriction in heart failure patients has been historically endorsed by guidelines,^{28,29} there is a lack of clinical trial evidence to support specific levels of sodium restriction.²⁶ However, sodium intake in the U.S. general population remains high (>4 g/d). Therefore, sodium restriction for patients with symptomatic HF to reduce congestive symptoms is considered to be reasonable.²⁵

4.4.2 Beta-Blocker Therapy

A beta-blocker should be prescribed to all heart failure patients with a left ventricular ejection fraction ≤ 40 percent (HFrEF) unless contraindicated. The three beta-blockers that have been shown to improve morbidity and mortality in patients with systolic heart failure include bisoprolol, carvedilol and metoprolol succinate.²⁵

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Beta-blockers should be started at low dosages and titrated up to the target doses established in clinical trials. Titration should be based upon patient tolerance, but can often be done at two-week intervals. In patients with newly diagnosed decompensated heart failure it is important to optimize volume status and discontinue IV diuretics and vasoactive agents prior to initiation of a beta-blocker. However, patients who have been established on a beta-blocker and subsequently develop decompensated heart failure should continue taking their beta-blocker unless they develop symptomatic bradycardia, refractory volume overload or cardiogenic shock. If treatment with a beta-blocker must be withdrawn, then dosage tapering is recommended. Abrupt discontinuation of beta-blockers should be avoided.²⁹

Table 4. Beta-blocker Dosing Recommendations for Heart Failure with Reduced Ejection Fraction

Beta-Blocker Dosing Recommendations for HFrEF ²⁵		
Drug	Initial Dose	Target Dose
Bisoprolol	1.25 mg daily	10 mg daily
Carvedilol IR	3.125 mg twice daily	25 – 50 mg twice daily*
Carvedilol CR	10 mg daily	80 mg daily
Metoprolol succinate XL	12.5 mg daily	200 mg daily

*Maximum recommended dosage 25 mg PO twice daily for patients <85 kg and 50 mg PO twice daily for patients >85 kg.

4.4.3 ACE Inhibitor/Angiotensin Receptor Blocker Therapy

An ACE Inhibitor (ACEI) should be prescribed to all HFrEF patients unless contraindicated. An angiotensin receptor blocker (ARB) is recommended in all HFrEF patients who are intolerant to ACE Inhibitors due to intractable cough.^{25,29} The non-productive cough associated with ACEI use can develop within hours to months of treatment onset and usually dissipates within one to four weeks of stopping treatment.³⁰

Additionally, an ARB may be utilized as an alternative to an ACEI in patients who are taking ARBs for other indications or in addition to an ACEI and beta-blocker in patients who cannot tolerate an aldosterone antagonist. However, the concomitant use of an ACEI with an ARB and aldosterone antagonist is not recommended due to the risk of adverse effects. Both ACEIs and ARBs have been shown to improve morbidity and mortality in patients with systolic heart failure.

ACEIs/ARBs should be started at low doses and titrated up to the target dosages established in clinical trials. Dose titration should not occur any quicker than every two weeks and generally consists of doubling the established dose until the target dosage is achieved. Also, all patients started on ACEIs/ARBs should have their renal function and serum potassium assessed within the first one to two weeks of therapy initiation, with each dosage change, and then periodically thereafter.^{25,29}

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Table 5. ACE Inhibitor Dosing Recommendations for Heart Failure with Reduced Ejection Fraction

ACE Inhibitor Dosing Recommendations for HFrEF ²⁵		
Drug	Initial Dose	Target Dose
Captopril	6.25 mg TID	50 mg TID
Enalapril	2.5 mg twice daily	10 - 20 mg twice daily
Fosinopril	5 - 10 mg daily	40 mg daily
Lisinopril	2.5 - 5 mg daily	20 - 40 mg daily
Perindopril	2 mg daily	8 - 16 mg daily
Quinapril	5 mg twice daily	20 mg twice daily
Ramipril	1.25 - 2.5 mg daily	10 mg daily
Trandolapril	1 mg daily	4 mg daily

Table 6. Angiotensin Receptor Blocker Dosing Recommendations in Heart Failure with Reduced Ejection Fraction

Angiotensin Receptor Blocker Dosing Recommendations in HFrEF ²⁵		
Drug	Initial Dose	Target Dose
Candesartan	4 - 8 mg daily	32 mg daily
Losartan	25 - 50 mg daily	50 - 100 mg daily
Valsartan	40 mg twice daily	160 mg twice daily

4.4.4 Loop Diuretics

Hospitalized HF patients who are admitted with signs and symptoms of fluid retention should be treated with an IV loop diuretic via bolus or infusion. The dose of IV loop diuretic utilized should either match or surpass the patient's oral home dose and should be titrated to an effective dose. Although loop diuretics have been shown to improve HF symptoms, their use will not improve mortality and therefore other mortality-improving therapies (i.e., ACEI/ARB, beta-blockers, aldosterone antagonist) should be continued if tolerated.

The proper monitoring of systemic perfusion and volume status represent the crux of successful loop diuretic utilization. Vital signs, body weight and fluid intake/output should be measured at the same time each day during hospitalization. In addition, a basic metabolic panel should be drawn daily to track electrolyte loss and renal function.²⁵

Click the following link to visit the Heart Foundation website and view the Fluid Management Algorithm in Heart Failure: http://www.heartonline.org.au/media/DRL/Fluid_management_algorithm_in_heart_failure.pdf.

4.4.5 Aldosterone Antagonists

Aldosterone antagonists are recommended to improve morbidity and mortality in NYHA class II – IV heart failure patients with a left ventricular ejection fraction (LVEF) ≤ 35 percent. Patients with NYHA class II HF should be on established therapy with an ACEI, beta-blocker, and have had a recent cardiovascular hospital admission or an elevated natriuretic peptide level prior to initiating treatment with an aldosterone antagonist.²⁵ These criteria mimic the

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patient population studied in the EMPHASIS-HF trial, which established the ability to utilize aldosterone antagonists in HF patients with mild symptoms.³¹ Additionally, aldosterone antagonists are recommended for use in patients with a LVEF ≤ 40 percent who suffer an acute myocardial infarction and develop symptoms of heart failure.

Hyperkalemia is a major concern in the use of these agents and therefore baseline renal function and serum potassium levels should be assessed prior to initiating treatment, while all potassium supplementation should be stopped.

Renal function and serum potassium should again be evaluated within two to three days of initiation, at day seven of treatment and periodically thereafter. The use of an aldosterone antagonist should immediately be discontinued if any of the following occur:

- Serum creatinine >2.5 mg/dL in men
- Serum creatinine >2.0 mg/dL in women
- Estimated GFR <30 mL/min
- Serum potassium >5.0 mEq/L²⁵

Table 7. Aldosterone Antagonist Dosing Recommendations in Heart Failure with Reduced Ejection Fraction GFR ≥ 50 mL/min²⁵

Aldosterone Antagonist Dosing Recommendations in HFrEF GFR ≥ 50 mL/min ²⁵		
Drug	Initial Dose	Maintenance Dose (after four weeks)
Spironolactone	12.5 - 25 mg daily	25 mg once or twice daily
Eplerenone	25 mg daily	50 mg daily

Table 8. Aldosterone Antagonist Dosing Recommendations in Heart Failure with Reduced Ejection Fraction GFR 30-49 mL/min

Aldosterone Antagonist Dosing Recommendations in HFrEF GFR 30-49 mL/min ²⁵		
Drug	Initial Dose	Maintenance Dose (after four weeks)
Spironolactone	12.5 mg daily or every other day	12.5 to 25 mg daily
Eplerenone	25 mg every other day	25 mg daily

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4.4.6 Statins

The use of statins in patients with HF without other underlying comorbidities has not been proven to be beneficial. Therefore the use of statins strictly to improve HF outcomes is not recommended.²⁵

4.4.7 Digoxin

The use of digoxin may be considered in patients with HFrEF who remain symptomatic despite the use of guideline-determined medical therapy (GDMT) to reduce the rate of hospitalizations.^{25,32}

Digoxin may be initiated at a dose of 0.125 mg daily in most patients. However dosing every other day may be necessary in patients who are underweight, over the age of 70 or who have poor renal function. No loading dose is necessary in HF patients. Digoxin serum concentrations should be maintained at <1 ng/mL to avoid toxicity. Some common concentration-dependent adverse effects from digoxin therapy include cardiac arrhythmias, gastrointestinal symptoms and neurological complaints. Also, the judicious management of hypokalemia, hypomagnesemia or hypothyroidism is necessary in patients taking digoxin due to their increased risk of developing digoxin toxicities at lower serum digoxin levels. Additionally, digoxin is a substrate of P-glycoprotein and therefore the concomitant use of medications that inhibit P-glycoprotein transport (i.e., amiodarone, propafenone, verapamil, clarithromycin) will increase digoxin concentrations and the risk of toxicity.^{25,29} Finally, a recently published meta-analysis on digoxin-associated mortality by Vamos et al. raised concerns that the use of digoxin without proper serum concentration monitoring can be associated with increased mortality in patients with atrial fibrillation and with HF.³³

4.4.8 Nitrates /Other Oral Vasodilators (Hydralazine)

In African-Americans with NYHA class II – IV HFrEF who remain symptomatic despite treatment with ACEIs and beta-blockers the addition of combination therapy with isosorbide dinitrate and hydralazine is recommended to improve morbidity and mortality. Additionally, the use of isosorbide dinitrate and hydralazine can be a beneficial alternative in any patient with HFrEF who cannot take an ACEI or ARB due to intolerance, contraindication or adverse effects.²⁵ However, ACEIs have been shown to have greater mortality benefits with fewer side effects in clinical trials.^{34,35} Both medications may be titrated as tolerated subsequent to the absence of side effects from initial dosing. Common side effects witnessed in clinical trials included headache and dizziness.^{34,36}

Table 9. Hydralazine/Isosorbide Dinitrate Dosing Recommendations in Heart Failure with Reduced Ejection Fraction

Hydralazine/Isosorbide Dinitrate Dosing Recommendations in HFrEF ²⁵		
Drug	Initial Dose	Maximum Dose
Hydralazine	25 - 50mg TID or QID	300 mg daily*
Isosorbide dinitrate	20 - 30 mg TID or QID	120 mg daily*
Fixed dose hydralazine and isosorbide dinitrate (37.5/20 mg)	1 tablet TID	2 Tablet TID

*Administer in divided doses TID or QID.

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4.4.9 Emerging Therapies (Ivabradine, Sacubitril/Valsartan)

Ivabradine

Ivabradine is a If channel inhibitor that has been shown to reduce the risk of hospitalization for worsening heart failure in patients with stable, symptomatic HFrEF who are in sinus rhythm with a resting heart rate ≥ 70 bpm. Candidates for ivabradine should either be receiving their maximally tolerated dose of a beta-blocker or have a contraindication to beta-blocker use.^{26,37}

The Systolic Heart Failure Treatment with the If inhibitor ivabradine Trial (SHIFT) was a randomized controlled trial designed to evaluate the cardiovascular outcomes, symptoms and quality of life of NYHA class II – IV HFrEF patients prescribed ivabradine in addition to GDMT. In this double-blind, placebo-controlled, parallel-group study 6,558 patients were randomized to receive ivabradine titrated to a dose of 7.5 mg twice daily or placebo. However, the dosage was maintained at 5 mg twice daily if the resting heart was between 50 – 60 bpm and was reduced to 2.5 mg twice daily if the patient experienced symptomatic bradycardia or had a resting heart rate < 50 bpm. The primary endpoint evaluated was a composite of cardiovascular death or hospital admission for worsening heart failure. During the median follow-up period of 22.9 months ivabradine significantly reduced the primary endpoint when compared to placebo (24% versus 29%; HR, 0.82; 95% CI, 0.75-0.90; $p < 0.0001$).³⁸

The recommended starting dose of ivabradine is 5 mg twice daily. Since the most common side effect to occur in SHIFT was bradycardia (10 percent), heart rate should be evaluated after two weeks of therapy and ivabradine should be titrated to a target heart rate of 50 – 60 bpm. Dosage adjustments should be made in accordance with the Table 10 below:

Table 10. Dosage Adjustment

Heart Rate	Dosage Adjustment ³⁷
>60 bpm	Increase by 2.5 mg twice daily (Maximum dosage 7.5 mg twice daily)
50 – 60 bpm	No change
<50 bpm or symptomatic bradycardia	Decrease by 2.5 mg twice daily If the current dose is 2.5 mg twice daily then discontinue

Sacubitril/Valsartan

Sacubitril/valsartan is a combination angiotensin receptor-neprilysin inhibitor (ARNI), which has been shown to reduce hospitalizations and mortality in patients with NYHA class II – IV HFrEF. Sacubitril/valsartan may be utilized first line in the place of an ACEI or ARB, but with GDMT.³⁹

The Prospective Comparison of ARNI with ACEI to Determine Impact on Global Mortality and Morbidity in Heart Failure, or PARADIGM-HF trial, was a randomized controlled trial, which evaluated the efficacy of sacubitril/valsartan versus enalapril in patients with NYHA class II – IV HFrEF. In this double-blind three-phase trial 8,442 patients were randomized to receive sacubitril/valsartan 200/160 mg twice daily or enalapril 10 mg twice daily. All eligible patients initially received a single blind run-in treatment of enalapril 10 mg twice daily for two weeks to ensure ACEI tolerance. Patients who tolerated enalapril without incident were moved onto phase two, which consisted of four to six weeks of single-blind sacubitril/valsartan titrated to a target dose of 200/160 mg twice daily. Then patients who tolerated both

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run-in phases without incident were randomized in a 1:1 ratio to double-blinded treatment with enalapril or sacubitril/valsartan.⁴⁰ To avoid the risk of angioedema seen in previous trials with concomitant ACE and neprilysin inhibitors all patients were given a 24-hour washout period prior to switching from one therapy to another.^{41,42} Patients with a history of angioedema, systolic blood pressure <95 mm Hg at randomization, a serum potassium level >5.4 mmol/L at randomization or a calculated creatinine clearance <30 mL/min were excluded from this trial. The primary outcome studied was a composite of death from cardiovascular causes or first hospitalization for heart failure. The trial was ended early due to the event rate in the enalapril group after a median follow-up period of 27 months. Sacubitril/valsartan was found to be superior to enalapril for the primary outcome (21.8% versus 26.5%; HR, 0.80; 95% CI, 0.73-0.87; $p < 0.001$).⁴⁰

The recommended starting dose of sacubitril/valsartan is 49/51 mg twice daily, which may be doubled after two to four weeks to a target dose of 97/103 mg twice daily if tolerated by the patient. A reduced starting dose of 24/26 mg twice daily is recommended in patients:

- who have never taken an ACEI or ARB
- who are taking low dosages of an ACEI or ARB
- with a estimated GFR <30 mL/min
- with moderate hepatic impairment (Child-Pugh B classification)

In addition, the use of sascubitril/valsartan is contraindicated in:

- patients with a history of angioedema due to an ACEI or ARB
- patients on a concomitant ACEI
- diabetic patients on concomitant aliskiren³⁹

4.4.10 Pharmacological Inotropic Support (Dopamine, Dobutamine, Milrinone)

The use of intravenous inotropic support should be considered in hospitalized systolic HF patients with cardiogenic shock or a combination of low blood pressure and diminished cardiac output to prevent end-organ damage and improve hemodynamic stability. Additionally, “bridge therapy” may be considered in Stage D HF refractory to GDMT in patients who are not candidates for, or awaiting, mechanical circulatory support or heart transplantation. Although the use of positive inotropes may temporarily improve hemodynamic instability, their use does not lead to improved outcomes in HF patients.²⁵

4.5 When to Refer to an Advanced Heart Failure Specialist

Despite the use of GDMT a portion of HF patients will develop advanced disease. Also, once a patient develops severe end-organ damage the utilization of heart transplantation may no longer be an option. Therefore, a timely referral of patients to an advanced heart failure specialist is encouraged. The following clinical findings are indicative of the need for referral to an advanced heart failure specialist:

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- Persistent NYHA class III or IV HF despite the use of GDMT/devices
- Deterioration of renal or liver function (serum creatinine >1.8 mg/dL or BUN >40 mg/dL)
- Beta-blocker or ACEI intolerance due to hypotension
- Recurrent HF hospitalizations (>1 every six months)
- Diuretic requirements increasing to >120 mg of furosemide daily (>60 mg of torsemide daily; >3 mg of bumetanide daily)⁴³

4.5.1 Potential Candidates for Devices, Advanced Mechanical Support and Transplant

Click the following link to visit the 2013 ACCF/AHA Guideline for the Management of Heart Failure to view their recommendations for inotropic support, MCS and cardiac transplantation:

<http://content.onlinejacc.org/article.aspx?articleid=1695825>.

4.5.2 Palliative Care, Hospice and Symptom Management

Many patients who reach Stage D HF will not be candidates for LVAD support or heart transplant due to their existing comorbidities. Once patients advance to end-stage HF their number of hospitalizations typically increase as their quality of life diminishes. This places a great burden on both the patient and his or her family.⁴³ Although the clinical regression of heart failure patients is difficult to predict, there are findings that should prompt clinicians to start an end-of-life discussion with patients and their caregivers. These include:

- Frequent hospital admissions despite optimized treatment
- Mechanical circulatory support and heart transplantation are not options
- Persistent diminished quality of life with NYHA class IV symptoms
- Cardiac cachexia (low serum albumin)
- Dependence in most activities of daily living
- Clinically judged to be close to the end of life²⁶

Once the decision is made by the patient to transition to palliative care and/or hospice, the focus of management should shift to patient comfort and quality of life. To accomplish this, relieving the common end-stage symptoms of dyspnea, fatigue, anorexia, cachexia and pain should become the primary goal.

To assist the patient in coping with continued breathlessness, home infusion of continuous inotropes is an option along with home oxygen, opioids and nitrates. Additionally, down-titration and/or withdrawal of beta-blockers and ACEI should be considered in hypotensive patients. Finally, since tachyarrhythmias are prominent in end-stage HF patients, careful consideration should be given to patients with implantable cardioverter-defibrillators (ICDs). Consideration should be given to disabling the defibrillation capability of the ICD to avoid recurrent shocks, while possibly maintaining cardiac resynchronization therapy (CRT) for symptomatic relief.⁴³

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4.6 Heart Failure Guideline-based Device Therapy by Heart Failure Class and Stage in Selected Patients

Table 11. Heart Failure Guideline-based Device Therapy by Heart Failure Class and Stage in Selected Patients

Stage B	Stage C	Stage D
Implantable cardioverter-defibrillator (ICD)	ICD	Heart transplant
Revascularization or valvular surgery as appropriate	Cardiac resynchronization therapy (CRT)	Temporary or permanent mechanical circulatory support
	Revascularization or valvular surgery as appropriate	ICD deactivation

(Adapted from Yancy CW et al. 2013 ACCF/AHA Guideline for the Management of Heart Failure. *Circulation*. 2013;128:e240-e327).

In addition to medical therapies, there are several device-based therapies that are used in patients with heart failure.

The decision to undertake electrophysiological intervention must be made in the context of an individual patient's functional status, prognosis, severity of underlying heart failure and comorbid conditions.

Devices considered for patients with heart failure include:

- Implantable Cardioverter Defibrillators (ICDs)
- Biventricular pacing/cardiac resynchronization therapy (CRT)
- Combination ICD/CRT devices
- Ventricular Assist Devices (VADs)

4.6.1 Biventricular Pacing/Cardiac Resynchronization Therapy (CRT)

The majority of patients with HF have interventricular conduction delay, and up to 30 percent to 50 percent have manifest bundle branch block caused by direct pathologic involvement of specialized conduction or by scarring of the myocardium. CRT seeks to normalize depolarization to improve the efficiency of ventricular contraction and ventricular septal motion, decrease atrioventricular valve regurgitation and increase diastolic filling time.^{44,45}

CRT fires into the ventricles both at the same time resulting in a more efficient and forceful cardiac contraction and improved cardiac output. CRT works by placing a lead in the right ventricle and a second lead in the coronary sinus via a coronary vein over the left ventricle. When both leads fire at the same time, it results in a re-synchronizing of the ventricles, and in patients with Stage C and D HF (NYHA Class III or IV) and wide QRS complex, the use of CRT decreases mortality up to 24 percent.

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CRT is:

1. Recommended for patients in sinus rhythm with QRS >120ms and LVEF <35 percent who have moderate to severe persistent symptoms despite optimal medical therapy
2. Considered for patients with atrial fibrillation with QRS >120ms and LVEF <35 percent who have moderate to severe persistent symptoms despite optimal medical therapy
3. Considered for ambulatory patients with NYHA Class IV symptoms who are in sinus rhythm with QRS >120ms
4. Considered for patients with NYHA Class I symptoms with QRS >150ms
5. Considered in patients with reduced LVEF who require chronic pacing and in whom it is expected will require frequent ventricular pacing

Combined ICD/CRT Therapy

Patients who are eligible for CRT may also be eligible for ICD placement. Patients with HF receiving CRT along with an ICD have up to as much as a 43 percent reduction in mortality compared with drug therapy alone.⁴⁶

4.6.2 Implantable Cardiac Defibrillators (ICDs)

More than 80 percent of patients who experience a life-threatening ventricular tachyarrhythmia do not survive to benefit from an ICD. Thus, the concept of the ICD for primary prevention of sudden cardiac death (SCD) has received considerable attention. Several large trials have demonstrated efficacy of prophylactic ICDs in certain patient groups.^{44,45}

Primary prevention refers to ischemic and non-ischemic patients who are at risk for SCD. ICD therapy is recommended for primary prevention of SCD:

1. Patients with LVEF <35 percent and mild to moderate HF symptoms, NYHA Class II or III, ischemic or non-ischemic
2. Patients with LVEF \leq 35 percent due to prior MI who are at least 40 days post-MI and are in NYHA functional **Class II or III**
3. ICD therapy is indicated in patients with LV dysfunction due to prior MI who are at least 40 days post-MI, have an LVEF \leq 30 percent and are in NYHA functional Class I
4. Consider for patients undergoing biventricular pacing/CRT device

Secondary prevention refers to patients who have survived a cardiac arrest due to VT or VF.

ICD implantation is recommended for survivors of cardiac arrest from ventricular fibrillation or hemodynamically unstable sustained VT that is not due to a transient, potentially reversible cause, such as acute MI.

ICD placement is not recommended for patients with chronic, severe refractory HF when there is no reasonable expectation for improvement or in patients who are not expected to survive one year.

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4.6.3 Implantable Pulmonary Pressure Monitors

The CardioMEMS™ HF System is the first and only Food and Drug Administration (FDA)-approved HF monitoring device proven to significantly reduce HF hospital admissions and improve quality of life in NYHA Class III HF patients who have been hospitalized in the previous 12 months.

This is the first permanently implantable wireless system intended to provide pulmonary artery (PA) pressure measurements, including systolic, diastolic and mean PA pressures. Changes in PA pressures are an early indicator of worsening heart failure, even before the patient notices symptoms such as shortness of breath or weight gain. The CardioMEMS™ HF System features a small pressure-sensing device that is implanted directly into the pulmonary artery during a minimally invasive procedure, enabling the patient to take PA pressure readings at home using a small bedside unit. The PA pressure data are reviewed by physicians who can make decisions regarding the status of the patient and, if necessary, initiate changes in medical therapy, with the goal of reducing hospitalization due to heart failure.⁴⁷



4.6.4 Ventricular Assist Device (VAD) Therapy

A ventricular assist device (VAD) is a mechanical pump that can provide partial or total circulatory support when the native heart, with optimal pharmacological therapy, is unable to maintain adequate circulation to perfuse vital organs.

There are three major often overlapping indications for the use of VADs:

- 1) As a bridge to transplantation for heart transplant candidates who are either “too sick” to wait for a donor to be identified because of severe acute, or acute-on-chronic HF, or have contraindications to transplantation which are deemed to be transient in nature (such as current tobacco usage);
- 2) As a lifelong support alternative for patients deemed ineligible for a heart transplantation, so-called destination therapy; and
- 3) As a bridge to myocardial recovery.

Bridge-to-a-bridge is used for those patients who present with severe shock or following cardiac arrest and are supported with a temporary support VAD to see if they become candidates for a long-term support device.⁴⁸

Visit the *Journal of the American College of Cardiology* to view the article Patient Selection for Ventricular Assist Devices: A Moving Target to review the figure on Algorithm for Selection of LVAD Candidates: <http://content.onlinejacc.org/article.aspx?articleid=1555246>.

Visit the 2013 ACCF/AHA Guideline for the Management of Heart Failure to view the Indications for CRT Therapy algorithm: <http://content.onlinejacc.org/article.aspx?articleid=1695825>.

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4.6.5 Cardiac Transplantation

Evaluation for cardiac transplantation is indicated for carefully selected patients with Stage D HF despite GDMT, device and surgical management. Cardiac transplantation is considered the gold standard for the treatment of refractory end-stage HF. Since the first successful cardiac transplantation in 1967, advances in immunosuppressive therapy have vastly improved the long-term survival of transplant recipients with a one-, three- and five-year post-transplant survival rate of 87.8 percent, 78.5 percent and 71.7 percent in adults, respectively. Similarly, cardiac transplantation has been shown to improve functional status and heart failure quality of life (HFQOL). The greatest survival benefit is seen in those patients who are at highest risk of death from advanced HF. Cardiopulmonary exercise testing helps refine candidate selection. Selected patients with Stage D HF and poor prognosis should be referred to a cardiac transplantation center for evaluation and transplant consideration.

When a patient with advanced HF is referred to a transplant center, the initial evaluation requires an assessment of the severity of HF, the identification of any potentially reversible factors and an assessment of the adequacy of current medical therapy. In a patient with ischemic or valvular heart disease, this involves assessment of myocardial viability and/or severity of valvular disease to determine whether there are percutaneous or surgical options. Arrhythmias should be addressed and treated. In patients with atrial fibrillation, rate control and/or restoration of sinus rhythm should be addressed. Similarly, treatment of ventricular arrhythmias with device implantation with or without antiarrhythmic therapy or ablation should be considered. In patients with prolonged QRS, use of biventricular pacing should be considered. Toxic agents such as persistent alcohol intake, illicit drug use or salt-retaining drugs such as nonsteroidal agents need to be discontinued. Medical therapy should be optimized with up-titration of vasodilators, diuretics and use of biventricular pacing as indicated. If possible, a few months of maximal medical therapy is administered to assess therapeutic response. If no reversible causes are identified and therapy is thought to be at an optimal level with the presence of Class III/IV symptoms, then the transplant evaluation process begins. However, if on referral the patient is in cardiogenic shock or on parenteral inotropic agents and cannot be tapered because of hypotension, end-organ dysfunction or symptoms, then the options for this patient are limited to cardiac transplantation, mechanical device support or palliative care.^{49,50}

Visit AHA's website to view the Contemporary Reviews in Cardiovascular Medicine, Selection of Cardiac Transplantation Cardiated in 2010. Figure 1:

<http://circ.ahajournals.org/content/122/2/173/F1.expansion.html>.

4.7 Determining Patient Preference

4.7.1 Patient Education

The majority of HF care is done at home by the patient and family or caregiver. If these individuals do not know what is required or fail to see its importance, they will not participate effectively in care. For this reason, comprehensive education and counseling are the foundation for all HF management. The goals of education and counseling are to help patients, their families and caregivers acquire the knowledge, skills, strategies and motivation necessary for adherence to the treatment plan and effective participation in self-care. The inclusion of family members and other caregivers is especially important, because HF patients often suffer from cognitive impairment, functional disabilities, multiple comorbidities and other conditions that limit their ability to fully comprehend, appreciate or enact what they learn.

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HF patients and their family members or caregivers need to receive individualized education and counseling that emphasizes self-care. This education and counseling should be delivered by providers using a team approach in which nurses with expertise in HF management provide the majority of education and counseling, supplemented by physician input and, when available and needed, input from dietitians, pharmacists and other healthcare providers.

Patients' literacy, cognitive status, psychologic state, culture and access to social and financial resources should be taken into account for optimal education and counseling. Because cognitive impairment and depression are common in HF and can seriously interfere with learning, patients should be screened for these. Appropriate interventions, such as supportive counseling and pharmacotherapy, are recommended for those patients found to be depressed.

It is recommended that educational sessions begin with an assessment of current HF knowledge, issues about which the patient wants to learn and the patient's perceived barriers to change. Address specific issues (e.g., medication nonadherence) and their causes (e.g., lack of knowledge vs. cost vs. forgetting) and employ strategies that promote behavior change, including motivational approaches.^{45,51}

The frequency and intensity of patient education and counseling vary according to the stage of illness. Patients with advanced HF or with persistent difficulty adhering to the recommended regimen require the most education and counseling. Patients should be offered a variety of options for learning about HF according to their individual preferences:

- Videotape
- One-on-one or group discussion
- Reading materials, translators, telephone calls, mailed information
- Internet
- Visits

Visit the AHA website to review helpful educational resources and patient management tools:

http://www.heart.org/HEARTORG/HealthcareResearch/GetWithTheGuidelines/GetWithTheGuidelines-HF/Target-HF-Patient-Education_UCM_432449_Article.jsp.

Target HF: Heart Failure Patient Education Fact Sheet

The Target:HFSM Get With The Guidelines[®]-Heart Failure patient education fact sheet was developed to explain the importance of patient education and the rationale for why specific information is important to obtain. Patient education is a critical success factor in helping patients manage their heart failure. By ensuring that your hospital has set goals surrounding patient education and has a clear understanding of what information is most important to convey to patients, you can help improve the overall quality of life with those affected by heart failure. This fact sheet is an effective tool in helping your hospital make patient education a priority.

Healthcare Professionals' Facts vs. Failure Sheet

This sheet includes breaking news, little-known facts, developing trends and points of interest surrounding heart failure, including patient-oriented information you can pass along.

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Guide to Tools for Targeting HF

This is a guide to using heart failure materials as well as suggestions for sharing information with patients, caregivers and colleagues.

https://www.heart.org/idc/groups/heart-public/@private/@wcm/@hcm/@gwtg/documents/downloadable/ucm_310295.pdf.

4.7.2 Self-Management Principles

Teaching is not sufficient without skill building and specification of critical target behaviors. Essential elements of patient education to promote self-care with associated skills are shown in Table 8.1: Essential Elements of Patient Education With Associated Skills and Target Behaviors at the following link:

<http://www.hfsa.org/hfsa-wp/content/uploads/2015/04/HFSA-2010-HF-Guidelines-Section-08.pdf>.

Self-Management and Behavioral Change Strategies

The Heart Failure Society of America (HFSA) (www.hfsa.org) offers printable patient education materials around the following subject areas:

- Taking Control of Your Heart Failure
- How to Follow a Low-Sodium Diet
- Heart Failure Medicines
- Self-care: Following Your Treatment Plan and Dealing with Your Symptoms
- Exercise and Activity
- Managing Feelings About Heart Failure
- Lifestyle Changes: Managing Other Chronic Conditions
- Advance Care Planning
- Heart Rhythm Problems
- How to Evaluate Claims of New Heart Failure Treatments and Cures
- Smoking Cessation - 1.800.QUITNOW

4.7.3 Medication Safety and Polypharmacy

Although there have been a multitude of advancements in the management of HF over the last three decades, the basis of mortality-improving treatment remains adherence to complex medication regimens. Since polypharmacy is often defined as the utilization of four or more drugs, it is virtually ubiquitous in patients being treated for HFrEF. This is largely due to the fact that as practice advances new therapies continue to be added on to the existing regimens, which increases the risk of adverse drug events and drug interactions.^{52,53} Therefore the minimization of polypharmacy should be a focal point for all clinicians managing HF patients. Steps to minimize polypharmacy and improve

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medication safety are listed below:

- All medications should be evaluated for safety, utility and potential drug interactions during each visit and care transition.
- Medications not providing clear benefits should be discontinued.
- Patients should be educated about their medications.
- Patients should be instructed to share their most up-to-date medication list upon visiting their physicians' offices and pharmacies.^{52,54}

4.7.4 Medications to Avoid in Heart Failure Patients

Although a thorough medication reconciliation process can improve HF patient outcomes through the focused use of GDMT there remains a myriad of medications that can worsen heart failure symptoms and/or induce exacerbations. Therefore, a strategy of minimization or avoidance of these medications should be implemented into the medication use process.^{55,56}

Visit Table 2: Prescription medications to avoid in patients with heart failure at the following link: https://books.google.com/books?id=KNWIBAAAQBAJ&pg=PT65&lpg=PT65&dq=Table+2+Prescription+medications+to+avoid+in+patients+with+heart+failure&source=bl&ots=QhfgXhDW3_&sig=DLSc_HhpdHzy9H56aS-mfWsuVAc&hl=en&sa=X&ved=0CDYQ6AEwA2oVChMlt7rspP6jyAIVSG0-Ch2Tmgy2#v=onepage&q=Table%20%20Prescription%20medications%20to%20avoid%20in%20patients%20with%20heart%20failure&f=false.

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5.1 Existing Heart Failure Performance Metrics

Current standardized performance metrics in heart failure (HF) are primarily limited to heart failure with reduced ejection fraction (HFrEF) that has been otherwise described as systolic heart failure as there is very limited data and evidence base to guide the management of heart failure with preserved ejection fraction (HFpEF) otherwise known as diastolic heart failure. These metrics are primarily aimed at the patient population admitted with a primary diagnosis of HF as many patients may have HF as a secondary diagnosis during their hospitalization or carry a chronic diagnosis of HF that is a secondary treatment focus within any given hospital encounter.

Table 12 displays current HF performance metrics formally endorsed by professional societies or accrediting agencies.

Given the heightened focus on preventable readmissions, the shift toward patient-centered outcomes in clinical trial and comparative effectiveness research, as well as the availability of new treatment options (e.g., ivabradine, sacubitril/valsartan, recent approval of Phase II cardiac rehabilitation for HF by CMS, and newer-generation ventricular assist devices) and the growing understanding that many patients with HF need input from palliative and/or hospice teams, there is a need to augment the current process-based HF metrics with additional care domains. Further expanding the range of performance metrics to included outcomes-based measures would also facilitate management of HF from a

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population health perspective, and The Joint Commission, through its Disease Specific Care Advanced Certification in Heart Failure (ACHF) program, has further expanded metrics that became effective on October 1, 2015. Additionally, tracking Quality of Life Scores among patients with an established diagnosis of HF might be one way to compare the performance of one accountable care organization versus another for effective patient-centered care of this condition.

Table 12. Heart Failure Measurement Set

Performance Metric	Description
ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure – Also endorsed by AHRQ	
1. LVEF assessment	Percentage of patients aged ≥ 18 y with a principal discharge diagnosis of HF with documentation in the hospital record of the results of an LVEF assessment performed either before arrival or during hospitalization, OR documentation in the hospital record that LVEF assessment is planned after discharge
2. Symptom and activity assessment	Percentage of patient visits for those patients aged ≥ 18 y with a diagnosis of HF with quantitative results of an evaluation of both current level of activity and clinical symptoms documented
3. Symptom management	Percentage of patient visits for those patients aged ≥ 18 y with a diagnosis of HF and with quantitative results of an evaluation of both level of activity AND clinical symptoms documented in which patient symptoms have improved or remained consistent with treatment goals since last assessment OR patient symptoms have demonstrated clinically important deterioration since last assessment with a documented plan of care
4. Beta-blocker therapy for LVSD (outpatient and inpatient setting)	Percentage of patients aged ≥ 18 y with a diagnosis of HF with a current or prior LVEF of $< 40\%$ who were prescribed beta-blocker therapy with bisoprolol, carvedilol, or sustained-release metoprolol succinate either within a 12-mo period when seen in the outpatient setting or at hospital discharge
5. ACE inhibitor or ARB therapy for LVSD (outpatient and inpatient setting)	Percentage of patients aged ≥ 18 y with a diagnosis of HF with a current or prior LVEF of $< 40\%$ who were prescribed ACE inhibitor or ARB therapy either within a 12-mo period when seen in the outpatient setting or at hospital discharge
6. Counseling about ICD implantation for patients with LVSD receiving combination medical therapy	Percentage of patients aged ≤ 18 y with a diagnosis of HF with current LVEF $\geq 35\%$ despite ACE inhibitor/ARB and beta-blocker therapy for at least three months who were counseled about ICD implantation as a treatment option for the prophylaxis of sudden death

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7. Post-discharge appointment for HF patients	Percentage of patients, regardless of age, discharged from an inpatient facility to ambulatory care or home health care with a principal discharge diagnosis of HF for whom a follow-up appointment was scheduled and documented, including location, date and time for a follow-up office visit or home healthcare visit (as specified)
National Quality Forum (NQF)-Endorsed HF Measures	
Beta-Blocker Therapy (i.e., Bisoprolol, Carvedilol, or Sustained-Release Metoprolol Succinate) for LVSD Prescribed at Discharge	Proportion of heart failure patients age 18 and older with LVSD for whom beta-blocker therapy (i.e., bisoprolol, carvedilol, or sustained-release metoprolol succinate) is prescribed at discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular systolic (LVS) function consistent with moderate or severe systolic dysfunction.
Heart Failure (HF): Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)	Percentage of patients aged 18 years and older with a diagnosis of heart failure (HF) with a current or prior left ventricular ejection fraction (LVEF) <40% who were prescribed ACE inhibitor or ARB therapy either within a 12-month period when seen in the outpatient setting OR at each hospital discharge
Heart Failure (HF): Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)	Percentage of patients aged 18 years and older with a diagnosis of heart failure (HF) with a current or prior left ventricular ejection fraction (LVEF) <40% who were prescribed beta-blocker therapy either within a 12-month period when seen in the outpatient setting OR at each hospital discharge
Heart Failure Admission Rate	Admissions with a principal diagnosis of heart failure per 100,000 population, ages 18 years and older. Excludes cardiac procedure admissions, obstetric admissions and transfers from other institutions.
Heart Failure Mortality Rate	In-hospital deaths per 1,000 hospital discharges with heart failure as a principal diagnosis for patients ages 18 years and older. Excludes obstetric discharges and transfers to another hospital.
Heart Failure: Left Ventricular Ejection Fraction Assessment (Outpatient Setting)	Percentage of patients aged 18 years and older with a diagnosis of heart failure for whom the quantitative or qualitative results of a recent or prior (any time in the past) LVEF assessment is documented within a 12-month period
Heart Failure: Post-Discharge Appointment for Heart Failure Patients	Percentage of patients, regardless of age, discharged from an inpatient facility to ambulatory care or home health care with a principal discharge diagnosis of heart failure for whom a follow-up appointment was scheduled and documented prior to discharge (as specified)

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Heart Failure: Symptom and Activity Assessment	Percentage of patient visits for those patients aged 18 years and older with a diagnosis of heart failure with quantitative results of an evaluation of both current level of activity and clinical symptoms documented
Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following heart failure (HF) hospitalization for patients 18 and older.	The measure estimates a hospital 30-day risk-standardized mortality rate (RSMR). Mortality is defined as death for any cause within 30 days after the date of admission of the index admission, for patients 18 and older discharged from the hospital with a principal diagnosis of heart failure (HF). CMS annually reports the measure for patients who are 65 years or older and are either enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are hospitalized in Veterans Health Administration (VA) facilities.
Hospital 30-day, all-cause, risk-standardized readmission rate (RSRR) following heart failure (HF) hospitalization	The measure estimates a hospital-level risk-standardized readmission rate (RSRR) for patients discharged from the hospital with a principal diagnosis of heart failure (HF). The outcome is defined as unplanned readmission for any cause within 30 days of the discharge date for the index admission. A specified set of planned readmissions do not count as readmissions. The target population is patients 18 and over. CMS annually reports the measure for patients who are 65 years or older and are either enrolled in fee-for-service (FFS) Medicare and hospitalized in non-federal hospitals or are hospitalized in Veterans Health Administration (VA) facilities.
Hospital-level, risk-standardized payment associated with a 30-day episode-of-care for heart failure (HF) (Resource Use Measure)	This measure estimates hospital-level, risk-standardized payment for a HF episode of care starting with inpatient admission to a short-term acute-care facility and extending 30 days post-admission for Medicare fee-for-service (FFS) patients who are 65 years of age or older with a principal discharge diagnosis of HF.
Post-Discharge Appointment for Heart Failure Patients	Patients for whom a follow-up appointment, including location, date, and time, for an office or home health visit for management of heart failure was scheduled within seven days post-discharge and documented.
Post-Discharge Evaluation for Heart Failure Patients	Patients who receive a re-evaluation for symptoms worsening and treatment compliance by a program team member within 72 hours after inpatient discharge.

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The Joint Commission	
Beta-Blocker Therapy (i.e., Bisoprolol, Carvedilol, or Sustained-Release Metoprolol Succinate Prescribed for LVSD at Discharge)	Beta-blocker therapy (i.e., Bisoprolol, Carvedilol, or Sustained-Release Metoprolol Succinate) is prescribed for heart failure patients with LVSD at discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40% or a narrative description of left ventricular systolic (LVS) function consistent with moderate or severe systolic dysfunction.
Post-Discharge Appointment for Heart Failure Patients	Patients for whom a follow-up appointment for an office or home health visit for management of heart failure was scheduled within seven days post-discharge and documented including location, date and time.
Care Transition Record Transmitted	<p>A care transition record is transmitted to a next level of care provider within seven days of discharge containing ALL of the following:</p> <ul style="list-style-type: none"> • Reason for hospitalization • Procedures performed during this hospitalization • Treatment(s)/service(s) provided during this hospitalization • Discharge medications, including dosage and indication for use • Follow-up treatment and services needed (e.g., post-discharge therapy, oxygen therapy, durable medical equipment)
Discussion of Advance Directives/Advance Care Planning	Patients who have documentation in the medical record of a one-time discussion of advance directives/advance care planning with a healthcare provider.
Advance Directive Executed	Patients who have documentation in the medical record that an advance directive was executed.
Post-Discharge Evaluation for Heart Failure Patients	Patients who receive a re-evaluation for symptoms worsening and treatment compliance by a program team member within 72 hours after inpatient discharge.

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ACCF indicates 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; and LVSD, left ventricular systolic dysfunction

Bonow, et al. ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Heart Failure: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Performance Measures and the American Medical Association–Physician Consortium for Performance Improvement. *Circulation*. 2012;125:00-00.

DOI: 10.1161/CIR.0b013e3182507bec

<http://circ.ahajournals.org/content/early/2012/04/23/CIR.0b013e3182507bec.full.pdf>

http://www.qualityforum.org/Measures_Reports_Tools.aspx

<http://www.jointcommission.org/assets/1/6/ACHFManual2015Oct.pdf>

5.2 Suggested Initial Metrics for Hospital-Based Heart Failure Quality Improvement Projects

Good performance measures share attributes of being correlated to patient outcomes, validity and feasibility (particularly in terms of time and effort required for data collection). Based on these principles, the existing metrics in Table 12 and the areas prioritized in the AHA Get With The Guidelines®–Heart Failure campaign (http://www.heart.org/HEARTORG/HealthcareResearch/GetWithTheGuidelines/GetWithTheGuidelines-HF/Get-With-The-Guidelines-Heart-Failure-Home-Page_UCM_306087_SubHomePage.jsp), it is recommended to track most, if not all, of the following performance measures as part of a HF QI project, as these measures have been shown to improve outcomes incrementally. To have the most meaningfully clinically significant impact on outcomes, many if not most of these metrics will need to improve in concert as it has been shown that single interventions are usually not sufficient to meaningfully impact readmission rates.

- **ACEI/ARB at Discharge:**

Numerator: Number of heart failure patients (I50.XX HF ICD-10 codes specified at the end of this section) with left ventricular systolic dysfunction (LVSD) and without both angiotensin-converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge. For purposes of this measure, LVSD is defined as chart documentation of a left ventricular ejection fraction (LVEF) less than 40 percent or a narrative description of left ventricular function (LVF) consistent with moderate or severe systolic dysfunction.

Denominator: Total of number of patients with HF (see ICD-10 codes for HFrEF) diagnoses documented during inpatient stay.

- **Evidence-based Specific Beta Blockers:**

Numerator: Total number of heart failure patients who were prescribed with evidence-based specific beta blockers (Bisoprolol, Carvedilol, Metoprolol Succinate CR/XL) at discharge.

Denominator: Total number of patients with HF (see ICD-10 codes for HFrEF) diagnoses documented during inpatient stay.

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- **Measure LV Function:**

Numerator: Total number of heart failure patients (all HF ICD-10 codes) with documentation in the hospital record that left ventricular function (LVF) was assessed before arrival, during hospitalization or is planned for after discharge.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Post-discharge Appointment for Heart Failure Patients within Seven Days:**

Numerator: Total number of eligible heart failure patients (all HF ICD-10 codes) for whom a follow-up appointment was scheduled and documented including location, date and time for follow-up visits or location and date for home health visit.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Activity-level Instruction:**

Numerator: Total number of heart failure patients discharged home with a copy of written instructions and educational materials given to patient or caregiver at discharge or during the hospital stay that addresses activity level.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Advanced Care Plan:**

Numerator: Number of heart failure patients who have an advanced care plan or surrogate decision-maker document (e.g., MOST form) in the medical record care transition record to a next level of care provider within 24 hours of discharge containing all of the following: reason for hospitalization, procedures performed during this hospitalization, treatment(s)/service(s) provided during this hospitalization, discharge medications, including dosage and indication for use, and follow-up treatment and services needed (e.g., post-discharge therapy, oxygen therapy, durable medical equipment).

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Diet Instruction:**

Numerator: Number of heart failure patients discharged home with a copy of written instructions or educational materials given to patient or caregiver at discharge or during the hospital stay, addressing diet.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Discharge Instructions:**

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

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

Step 5: Choose Metrics and Develop a Data Collection Plan

- **Medication Instruction:**

Numerator: Number of heart failure patients discharged home with a copy of written instructions or educational materials given to patient or caregiver at discharge or during the hospital stay, addressing discharge medications.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Referral to HF Disease Management, 60-Minutes Patient Education or HF Interactive Workbook:**

Numerator: Number of heart failure patients who were referred to heart failure disease management, received 60 minutes of patient education by a qualified educator or received an AHA heart failure interactive workbook.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Follow-up Instruction:**

Numerator: Number of heart failure patients discharged home with a copy of written instructions or educational materials given to patient or caregiver at discharge or during the hospital stay, addressing follow-up appointment.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Follow-up Visit or Contact within 72 hours of Discharge Scheduled:**

Numerator: Number of heart failure patients who had a follow-up visit or phone call scheduled to take place within 72 hours or less of hospital discharge.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Symptoms Worsening Instruction:**

Numerator: Percent of heart failure patients discharged home with a copy of written instructions or educational materials given to patient or caregiver at discharge or during the hospital stay, addressing what to do if symptoms worsen.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Weight Instruction:**

Numerator: Number of heart failure patients discharged home with a copy of written instructions or educational materials given to patient or caregiver at discharge or during the hospital stay, addressing weight monitoring.

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

- **Target Heart Failure Recognition Measure:**

Numerator: Number of heart failure patients who received ACEI/ARB, Evidenced-Based Beta Blockers, Aldosterone Antagonist medications at discharge (if eligible), for whom a follow-up visit or contact within seven days of discharge scheduled, and who were referred to one or more enhanced education (referral to disease management program, 60 minutes of patient education, or HF interactive workbook).

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

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- **30-Day Readmission Rate:**

Numerator: Number of index encounters where there is a readmission within 30 days. (If a readmission occurs beyond 30 days, then it is considered as an independent index event.)

Denominator: Total number of patients with HF (all HF ICD-10 codes) diagnoses documented during the inpatient stay.

ICD-10 Codes for HF_rEF (note HF_pEF ICD-10 codes should not be used in the denominator for some measures):

I50.1 Left ventricular failure

I50.2 Systolic (congestive) heart failure

I50.20 Un-specified systolic (congestive) heart failure

I50.21 Acute systolic (congestive) heart failure

I50.22 Chronic systolic (congestive) heart failure

I50.23 Acute on chronic systolic (congestive) heart failure

I50.4 Combined systolic (congestive) and diastolic (congestive) heart failure

I50.40 Unspecified combined systolic (congestive) and diastolic (congestive) heart failure

I50.41 Acute combined systolic (congestive) and diastolic (congestive) heart failure

I50.42 Chronic combined systolic (congestive) and diastolic (congestive) heart failure

I50.43 Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure

I50.9 Heart failure, unspecified

ICD-10 Codes for HF_pEF:

I50.3 Diastolic (congestive) heart failure

I50.30 Unspecified diastolic (congestive) heart failure

I50.31 Acute diastolic (congestive) heart failure

I50.32 Chronic diastolic (congestive) heart failure

I50.33 Acute on chronic diastolic (congestive) heart failure

5.3 Define Data Collection Strategies

The main decision point regarding data extraction for HF QI relates to the availability of EMRs within your facility and the extent to which these systems contain data elements of interest that can be collected without manual chart review. Even if HF populations and use of associated evidence-based treatments can be identified using EMR data, unless a structured note has been created to record treatments provided, education administered, mortality or readmission rate, some manual extraction will be required.

Step 5: Choose Metrics and Develop a Data Collection Plan

For data elements that can be extracted electronically, a 100 percent case sampling approach should be used. For data requiring manual extraction, a random sampling approach (10 charts a month is typically adequate for a given unit or hospital) is a cost-conscious and well-accepted approach for process performance measurement.

Suggested guidelines to be established regarding the manual extraction process include:

- What is the sampling plan (what, where, when and how much data)?
- Who will record the data and what will be measured?
- What instrument(s) will be used to classify performance of the measure(s)?
- Is there a standardized data collection form?
- What sort of training will be required for those performing the data extraction?
- How will the data be logged and collated?
- How will a truly random patient sample be secured?

Data can be extracted from electronic sources more efficiently, but generates many of the same issues listed above, along with some new issues, such as:

- Where can the electronic data elements be found in an accessible format?
- Does the electronic data need to be transformed to be useful?
- Is the electronic data valid? How will this be checked?
- Are structured notes available?

5.4 Evolution in Data Collection

Initially, most hospitals will have to collect data using a hybrid approach of electronic and manual data extraction, as indicated in Table 13.

Table 13: Initial Data Collection Matrix for HF QI

Data Element	Source	Metric Supported
ICD-10 Codes	Administrative Data	Population identification
Heart Failure Stage and Class	Physician Notes	Documented performance of assessment of Impairment Severity related to HF symptoms
ACEI/ARB at Discharge	Medication records; administrative data	% of patients with HF discharged on ACEI/ARB
Risk/benefit assessment	Physician notes	Documentation for valid reasons why evidence-based therapy was not provided

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ICD-10 Codes	Administrative Data	30-day all-cause readmission rate in patients with a discharge diagnosis of HF
Relationship of HF to Readmission	Determining causality would require chart review	

Over time, as each hospital's EMR evolves, an increasing percentage of these data elements will be amenable to electronic extraction for data collection. Building infrastructure in the form of note templates, interactive risk assessment tools embedded into the EMR, medication records, etc. to support this type of streamlined data collection and minimize reliance on manual chart review and multiple data sources can be a very useful specific tactic in the QI program itself. Time invested early on in the project with IT collaborators to create discrete, readily extractable data elements for performance measurement and reporting will yield major returns. Ultimately, a functional 'inpatient HF registry' continuing clinical and administrative data would be a desirable future state, and could be used to generate customized reports.

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6.1 Inpatient HF Measures

Four major inpatient performance measures according to the 2011 ACCF/AHA-PCPI Performance Measures guidelines are:

- 1) Left ventricular ejection fraction assessment
- 2) Beta-blocker therapy for left ventricular systolic dysfunction (EF<40 or moderate to severe systolic dysfunction)
- 3) ACE inhibitor or ARB therapy for LVSD (no contraindication)
- 4) Post-discharge appointment for HF patients.⁵⁷

Most of the interventions to decrease 30-day readmission rate and mortality rate have been focusing on these four HF measures. There were three inpatient HF measures retired from the previous 2005 Guideline and these are:

- 1) Anticoagulation at discharge for HF patients with atrial fibrillation
- 2) Discharge instructions
- 3) Adult smoking cessation advice/counseling, which have been regarded less important than current HF measures and did not succeed to decrease either 30-day readmission rate or 30-day mortality rate.⁵⁸

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6.2 Outcomes

Several outcomes can be measured based on different programs and these include the following:

- 1) Reduce death
- 2) Decrease hospitalization
- 3) Reduce readmission rates
- 4) Improve symptoms
- 5) Improve activity level
- 6) Improve health status and sense of well-being

Among these, the two most important outcomes are 30-day readmission rate and 30-day mortality rate. The CMS has been focusing on 30-day readmission rate and this can be calculated as 30-day risk-standardized readmission rate (RSRR).

6.2.1 30-day Readmission Rate

Readmission rate within six months after hospitalization for congestive heart failure was reported as 44 percent for Medicare beneficiaries.⁵⁹ Recent studies showed that 30-day readmission rate and 30-day mortality rate were 24.4 percent and 11.1 percent, respectively.⁶⁰ This striking rate of readmission led hospitals to develop strategies to prevent this frequent readmission. ACCF/AHA/AMA-PCPI outlined and published four important inpatient congestive heart failure measures in 2011 to prevent readmission:

- 1) Left ventricular ejection fraction assessment
- 2) Beta-blocker therapy for left ventricular systolic dysfunction
- 3) ACE inhibitor or ARB therapy for left ventricular systolic dysfunction
- 4) Post-discharge appointment for patients⁵⁷

LVEF measurement is important not only in classifying CHF as systolic or diastolic but also in consideration of medical and device therapy. Beta-blocker and ACEI/ARB therapy are essential in systolic CHF management to prevent readmission. Patients who had early physician follow-up after discharge showed lower rate of readmission and this new measure was first included in the 2011 Guideline.⁶¹

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6.2.2 30-day Mortality

There are several management strategies for CHF proven to decrease mortality:

- 1) Beta blocker
- 2) ACEI/ARB
- 3) Aldosterone antagonist
- 4) Combination of hydralazine and isosorbide dinitrate
- 5) Cardiac rehabilitation
- 6) CRT ICD⁶²

These strategies can be applied according to the patient's classification and stage of heart failure.

6.3 Hospital Strategies

The measures proposed in the 2011 Guideline were intended to complement National Quality Forum-endorsed HF outcome measures, such as the 30-day mortality and readmission measures.⁵⁷ Each hospital has been forming its own strategy to decrease the mortality and readmission rates. The Affordable Care Act (ACA) established the Hospital Readmission Reduction Program (HRRP) in order to decrease the readmission rate.⁶³ These new incentives are designed to reduce readmissions and hospitals with high readmission rates can lose ≤ 3 percent of their Medicare reimbursement. Risk-adjusted 30-day readmission rates are used to measure hospital performance. Other hospital strategies known to reduce 30-day readmission rates are:

- 1) Partnering with community physicians or physician groups
- 2) Partnering with local hospitals to reduce readmissions
- 3) Having nurses responsible for medication reconciliation
- 4) Arranging follow-up appointments before discharge
- 5) Having a process in place to send all discharge papers or electronic summaries directly to the patient's primary physician and
- 6) Assigning staff to follow up on test results that return after the patient is discharged⁶⁴

6.4 Intervention

6.4.1 Intervention 1: Patient Education

Patient education is very important to detect changes of symptoms, such as body weight or clinical status, early enough for the patient or a care provider to intervene and to prevent hospitalization from clinical deterioration.⁶⁵ In

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a meta-analysis of 18 studies, patients who received patient education and proper discharge instruction showed a decrease in all-cause mortality, length of stay, hospital costs and an improvement in quality-of-life scores.⁶⁶ A minimum of 60 minutes of patient education is required in order to ensure that the patient and caregiver understand what actions must be taken post-discharge. Some of the common interventions are:

- 1) Educating both patients and family or caregiver
- 2) Discussing behavioral strategies to increase adherence to prescribed diet and medications
- 3) Offering advice about increasing physical activity and strategies to improve ability to perform desired activities
- 4) Teaching about monitoring for signs and symptoms of decompensation, including daily weighing
- 5) Offering advice about what to do in case of escalating signs and symptoms⁶⁷

6.4.2 Intervention 2: Development of Protocol on Admission

Initial admission protocol should be developed by the Heart Failure Committee members at each hospital. This should include the inpatient heart failure measures, stage of heart failure, ejection fraction from echocardiogram, current drug therapy, life-style modification, additional measures and referral consults.

6.4.3 Intervention 3: Standardized Guideline-Based Order Sets

Implementing an evidence-based standardized order set can help improve outcomes, reduce cost of care and increase adherence to core measures.⁶⁸ Although this was not proven to decrease 30-day mortality or readmission rate, each hospital should develop its own Guideline-based order set that can include the heart failure core measures.

6.4.4 Intervention 4: Readmission Checklist

Identifying potential gaps in transitional care of patients with heart failure that contribute to potentially preventable readmissions can improve patient care and enhance quality improvement. Some of the reasons for readmissions are:

- 1) Failure to actively include the patient and caregiver in identifying needs, resources and planning for the discharge
- 2) Failure to recognize worsening clinical status prior to discharge
- 3) Lack of understanding of the patient's physical and cognitive functional health status
- 4) Medication errors and adverse drug events
- 5) Failure to optimize doses prospectively

A readmission checklist is designed to find the root cause for readmission and help healthcare providers to prevent readmission. Once gaps in care are identified, processes within the local health system can be evaluated and targeted

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for improvement. Some suggest a different angle of attacking readmissions by showing the benefit of institution-specific readmission prediction models for core measures including heart failure at the point of discharge. The goal with this type of process is to alert the appropriate people (nurse, respiratory therapist, physician, etc.) that a patient is at high risk for readmission early on so that appropriate counter activities can be started even before leaving the hospital while the care team has the greatest influence.⁶⁹ Many different factors can potentially be included in the risk determination model depending on the historical risk of those factors within particular institutions. Hospitals are looking at variables including age, comorbidities, social support and even rural vs. urban residences when establishing risk prediction models.^{69,70}

Please see: Appendix F. Readmission check list from TARGET:HF.

6.4.5 Intervention 5: Discharge Checklist

The HF discharge checklist was proven to improve quality of care and decrease readmission rate for patients admitted with HF.⁷¹ This should include core HF measures, documentation regarding medication use, appropriate dose up-titration, relevant education, patient counseling and follow-up appointment and instructions. Many electronic health record systems are incorporating discharge checklists in the discharge workflow. This enables institutions to improve the quality of heart failure care at the point of discharge by shaping discharge protocols. One component of the discharge checklist that can be time consuming includes educating patients while in the hospital as well as providing follow-up phone calls. Many institutions are implementing pharmacy-driven discharge processes that include a variety of checklist activities being performed by the pharmacist. Some of these include medication and disease counseling, ensuring that patients are able to secure discharge medications and ultimately follow-up phone calls.⁷² Pharmacy involvement is critical since compliance with standard heart failure practices involves the addition of often two to three new medicines. In fact, 25 percent of patients hospitalized for heart failure start more than one new medication.⁷³ Other hospitals have different forms of nurse-led follow-up calls and motivational interviewing that are showing a reduction in readmissions.⁷⁴ Hospitals that are functioning within systems are benefiting from shared models that ensure a follow-up appointment within seven days to decrease heart failure readmissions.⁷⁵ Please see: Appendix G. Discharge checklist from TARGET: HF.

6.4.6 Intervention 6: Feedback of Performance to Providers

Providers should follow heart failure core measures and the performance report for quality improvement should be provided to them. Each hospital can have its own incentives to motivate them to comply with those core measures. Ongoing quality assessment and improvement specific for heart failure is another important part for heart failure quality improvement modality. Regular feedback of adherence to the heart failure core measures should be considered as part of the facility's quality assessment efforts. Daily workflow including multidisciplinary rounding can provide feedback to individual providers and have a beneficial effect on compliance with core measures.⁷⁶ In the literature, there is currently limited and variable data regarding provider feedback and positive outcomes. Even regarding other quality metrics for diagnoses outside of heart failure, data remains limited. Small studies in the areas of surgical care improvement and blood pressure control show provider feedback having a positive impact on patient outcomes.^{77,78} Information regarding outcomes and provider feedback should become more prevalent as physician behaviors are reported more openly moving forward. In one study regarding stroke care, providers noted the perceived value of feedback but

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also expressed concern about how measures were obtained and the downstream ramifications of potential public reporting.⁷⁹

6.4.7 Intervention 7: Focus on Provider Education

Continued education regarding heart failure core measures should be given to the providers, and regular performance evaluations for quality improvement should be designed. A quality improvement conference can be a good example of provider education. Multidisciplinary rounding can aid in ongoing educational efforts as well.⁷⁶

6.5 Monitoring Your Interventions

Regular quality assessment meetings with each provider can improve the hospital's adherence to the core heart failure measures. Incentives to the better-performing provider can motivate other providers to improve their quality of care. Having multispecialty meetings and educational conferences can also improve the general quality of care of patients with heart failure. We strongly recommend that each hospital set up its own quality improvement project and continue to improve their practice of care.

Step 7: Improve Transitions of Care for Patients with Heart Failure

In the United States and long-term care system, patients, particularly seniors and those with chronic illness, experience multiple transitions of care — meaning that they leave one care setting (i.e., hospital, nursing facility, assisted living facility, primary care physician care, home health care or specialist care), and move to another. Care coordination is a related, but distinct, concept that refers to the interaction of providers to ensure optimal care for a patient. Every transition of care will involve care coordination, but care coordination is a broader process that typically encompasses the assessment of the patient's needs, development and implementation of a plan of care, and evaluation of the care plan.⁸⁰

Patients with heart failure are often at risk of miscommunication and a lack of understanding about their illness and their ability to manage not only their symptoms but also their medications. Because these patients see multiple providers through the course of treatment and often experience stays in various levels of care, the effort to improve the transition process from the hospital to the community needs to be a major focus.

7.1 Transition from Emergency Department to Care Unit

Transitions from the emergency department to the care unit require a focus on providing timely and accurate information to the clinical team. As patients move across transition points of care, issues with medication discrepancies are at greater risk. A 2011 study found patients in the emergency department are vulnerable to medication discrepancies because they are in an environment in which rapid decisions need to be made under

Step 7: Improve Transitions of Care for Patients with Heart Failure

high levels of stress.⁸¹ Medication prescribed in the emergency department should be reconciled with all previous medications and any dosages given prior to the transition to the care unit documented and communicated.

7.1.1 Transition from the Emergency Department to Home

Studies show that 85 percent of emergency room visits end in discharges.⁸² If the patient is returning home, the emergency department staff should schedule a follow-up home call or visit, ensure there is an outpatient practitioner follow-up, provide a plan of care and medication list, and determine the ability of the patient to obtain newly prescribed medications. It is important, to the extent possible, that the emergency department assist in coordinating transitions to a nursing home or assisted living facility.

7.2 Health Literacy

Health literacy is defined as “the degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions.”⁸³ For many patients the conversation with their providers utilizing medical terminology and the speed with which the providers present that information often gains a nod of yes but a look of “what in the world are you talking about.” It is important that providers understand handing a written document to the patient and family, whether a care plan, medication list, transition or discharge summary, does not mean communication was effective or they understand what actions are needed. Health literacy and educational reading level are not the same thing.

Health literacy requires that patients can read and understand the instructions on a medication bottle, how to take it, when to take it and when to refill or not refill the prescription. It means they understand their treatment plan, educational brochures, consent forms and doctor’s instructions so they can follow through with the appropriate actions. With the increase of shared responsibility between physician and patient for healthcare coordination and adherence, providers need to know the status of the patient’s and family caregiver’s health literacy skills.

Certain populations are at greater risk, such as the elderly, patients with cognitive dysfunction, lower socio-economic populations and patients where English is not their primary language. According to the American Medical Association report, [Health Literacy and Patient Safety: Help Patients Understand](#), “poor health literacy is a stronger predictor of a person’s health than age, income, employment status, education level and race.”⁸⁴

View the American Medical Association video. https://www.youtube.com/watch?v=cGtTZ_vxjyA

Tips to assist with improving health literacy include the following⁸⁵:

- Use plain language
- Limit information (three to five key points)
- Be specific and concrete, not general
- Demonstrate, draw pictures, use models
- Repeat/summarize
- Teach-Back (confirm understanding)
- Be positive, hopeful, empowering

Step 7: Improve Transitions of Care for Patients with Heart Failure

7.3 Developing a Multidisciplinary Patient Care Plan

No one discipline is totally responsible for the patient's care plan. The clinical team working collaboratively to deliver health services and treatment must be able to contribute to the patient care plan if consistency, adherence and improved clinical outcomes are expected. The issues of clinical and non-clinical barriers to care along with treatment interventions must be incorporated in an electronic medical record (EMR) or at minimum a written medical chart. To enhance both clinical and patient outcomes the assessment process should include medical, behavioral, social and health system issues that impact the patient's ability to follow the course of treatment and be engaged with the clinical team. The care plan must also include the patient's preferences and support the development of self-management skills for the patient and family caregiver. The patient care plan implemented during the hospital stay should build a quality discharge summary at the point of transition from the hospital to the next level of care.

7.3.1 Patient Factors

Patient factors, both clinical and non-clinical, can impact safe transitions. Non-adherence to the care plan, not following provider instructions around treatment options and unwillingness to engage with the clinical team can be contributing factors to hospital readmissions. Patient factors that should be considered are⁸⁶:

- Knowledge and beliefs
- Motivation to change
- Confidence in management
- Expected outcomes from the patient perspective
- Understanding of the consequences

Assessing for risk of non-adherence with patients is essential for engaging and supporting the patient not only through an acute episode of care and transition from the hospital to the next level of care but in support of the continuity of care in the community. Many factors can impact adherence for patients and caregivers. Areas for consideration include:

- Condition-related factors, i.e., polypharmacy, multiple chronic conditions, disability
- Therapy-related factors – complexity of medication regimes, negative or unpleasant side-effects, length of time for the medications to demonstrate effect
- Healthcare-related factors – gaps in provision of care, poor patient experience with the healthcare system, poor communication between providers and with providers
- Socioeconomic factors – low socioeconomic status, poor access to care, financial concerns such as food versus medication, unemployment, no family support, English is not their primary language, racial disparities

Visit the Case Managers Society of America website for the updated Case Management Adherence Guide for the latest assessment and intervention guide to improve patient adherence.

<http://solutions.cmsa.org/acton/fs/blocks/showLandingPage/a/10442/p/p-001f/t/page/fm/0>.

Step 7: Improve Transitions of Care for Patients with Heart Failure

7.3.2 Caregiver Factors

Caregivers, whether the spouse, family or neighbor, are an important faction in supporting the patient while interacting with healthcare providers through the course of treatment. Caregivers often monitor their loved ones' well-being, report symptoms and manage medications. Yet, often caregivers are not assessed for their personal issues that play into their caregiving role. The patient's primary caregiver may be a spouse, loved one or friend who themselves is dealing with health concerns or is employed and trying to manage both the care of the patient and their job. The caregiver's health literacy, communication skills, health knowledge and ability to assist with self-managed medical care must be assessed when looking to them for their assistance and support. For many patients, remaining in their home instead of other living arrangements is dependent on their primary caregiver's ability to provide care and coordination.

7.3.3 Care Plan Communication in Transition from Hospital to Home/Ambulatory Setting

Patients with HF need a transition care plan that supports the continuity of care and is shared with the receiving provider. The transfer of information from the hospital to the next level of care requires timely sharing of important care information, medication regime and follow-up care among the patient, family caregiver and healthcare providers. The care plan should address both clinical and non-clinical interventions for the patient and family caregiver. For many patients with HF, remote monitoring may be an intervention that needs to be included in the care plan with awareness of symptom assessment. Other interventions that may need to be included on the care plan are dietary restriction, fluid restrictions, alcohol and caffeine consumption, physical activity, smoking cessation and preventive behaviors.

7.4 High-Risk Pharmacy Counseling

Patients admitted with HF and other chronic illnesses can benefit from utilization of a high-risk pharmacist. It is important to seek senior leadership financial support for this effort since it potentially requires dedicated pharmacist time for education and conversations with high-risk patients.

There are different models that can be employed for high-risk pharmacy needs. Some hospitals may localize a high-risk pharmacist to a few key areas or floors within the hospital. Others are implementing more widespread, methodical pharmacy input from admission to discharge. Still others are targeting high-risk groups of patients including patients hospitalized for CMS core measure conditions such as acute myocardial infarction, pneumonia and HF or patients on oral anticoagulants including warfarin or new oral anticoagulants. Decreased readmissions with use of a high-risk pharmacy intervention has been documented, seeming to contribute to a financial case to support high-risk pharmacy intervention, not to mention improved patient safety and quality of care.⁸⁷

Many larger hospitals, including academic medical centers, have a dedicated ICU or cardiac pharmacist who oversees inpatient prescribing practices. This pharmacist can be instrumental, especially in academic settings, in reviewing dosing of medications, checking for drug interactions and making recommendations regarding medication changes. As patients transition out of an ICU setting, another pharmacist will assume oversight of that patient by reconciling home medications with patients and their outpatient pharmacies. These pharmacists are often able to participate in interdisciplinary rounding on a particular floor involving the entire care team. In this setting, they can make recommendations and the group can agree on the focus of education for a particular patient for a particular day.

Step 7: Improve Transitions of Care for Patients with Heart Failure

At the point of discharge, high-risk pharmacy colleagues are an excellent option for patient education on new medications or changing doses of medication both before and after the patient leaves the hospital. A pharmacy-led transitions of care program has been shown to provide consistent medication reconciliation and ultimately an improvement in HF core measure compliance and patient satisfaction scores.⁸⁸ In some situations, pharmacist involvement at the point of discharge has revealed patient challenges to compliance that provide a springboard for improvement.⁸⁹ In addition, it is typically the high-risk pharmacist who reviews the appropriateness of anticoagulation and antiplatelet regimens when these agents are being started and stopped. Involvement of pharmacists even post-discharge from heart failure admissions has produced lower 30-day HF-related hospital readmission rates and provides another point of intervention for high-risk HF patients.⁹⁰

7.5 Multidisciplinary Rounds

Multidisciplinary rounding is key to facilitating successful communication among healthcare team members as well as promoting quality action plans and communication to and from patients and their families. Navigating a hospital stay can be quite daunting for even the most seasoned, educated and financially nimble patients. The challenges of being a patient are amplified when there is an inability to understand the medical jargon of the hospital, a lack of general literacy or health literacy and also financial difficulties related to health insurance or lack thereof.

Multidisciplinary rounding allows the healthcare team to communicate a “360 snapshot” of sorts to each other regarding the status of a patient, their needs and the family dynamics. This information can prove to be highly valuable, not only to the patient but also to the healthcare team members. This teamwork promotes consistent delivery of the plan of care as well as communication about what to expect upon discharge.

For patients’ benefits, it is known in the literature that a team approach via multidisciplinary rounding improves patient quality of care by improving safety as well as reducing adverse events such as falls, for example.^{91,92} In 2013, The Joint Commission reported communication as one of the root causes in more than 60 percent of sentinel events for that year.⁹³ In short, quality healthcare team interactions are essential for optimal care of patients. In addition, there is improved job satisfaction among the healthcare team⁹⁴ as well as enhanced resident education and a shorter length of stay for core measure diagnoses associated with multidisciplinary rounds.⁹⁵

Multidisciplinary rounds look different at different hospitals depending on available resources, the culture of the physician workforce and levels of engagement by all employee groups. Out of respect for each team member’s time, most general medicine floors have multidisciplinary rounding as a meeting behind closed doors. Typically these meetings are daily on weekdays. Those in attendance include the physician, charge nurse, bedside nurse, allied health professionals, pharmacist, case manager and social worker. Not everyone needs to speak about every patient depending on the active issues surrounding a particular patient. Rounds are typically led by the case manager or physician with a goal for the group to spend no more than two to three minutes on any one patient most of the time.

There are several challenges related to initiating multidisciplinary rounding effectively. The first is trying to get physicians to reliably attend – which is improved if the majority of a physician’s patients are on one or two floors only. Another challenge involves trying to keep the rounds concise while also being useful. Some hospitals have migrated toward a more structured interdisciplinary rounding experience that is done at the bedside where the patient can ask questions, too. EMRs can facilitate a most efficient display of relevant data at a glance, which can be used as a springboard for team discussion.⁹⁶ A standard form such as this can also be a bridge for transition to and from the ICU.⁹⁷

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7.6 “Teach Back” Method for Quality Assurance of Patient Education

Patients with HF who are going home need to feel confident they can do the clinical interventions and self-management activities the care team has included on their care plan. Among those will be medication management, symptom management and behavior change. Teach Back is an important strategy used to confirm education and patient comprehension. When imparting new information, whether about a medication, procedure or prescribed self-management instructions, the care team must explain the new concept in plain language to the patient, assess the patient’s recall and comprehension, and then clarify information based on the assessment. If the teaching involves using a procedure, have the patient demonstrate the procedure and assess with the patient the procedure process for recall and comprehension.⁹⁸ If the family caregiver is the manager of care, be sure that he or she is included in the Teach Back. Use open-ended questions with the patient and family caregiver during the Teach Back and give plenty of time for the patient to answer or demonstrate the process.

7.7 Elements of a “Quality Discharge”

There needs to be a formal process that facilitates a quality discharge and safe transition of patients from one level of care to another, including home or from one practitioner to another. Hospitalists can help coordinate complex inpatient medical care from admission through all care transitions up to discharge, leading multidisciplinary teams in their institutions to improve processes and care transitions. As leaders of multidisciplinary teams, hospitalists have a unique opportunity to enhance the discharge process, in collaboration with their teams, to a consistent set of standards improving timeliness, content and transfer of information to outpatient providers.

Effective communication is central to the role of the hospitalist, and a quality discharge process and summary are necessary in promoting efficient, safe and high-quality care and reducing discontinuity of care. Hospitalists communicate in multiple modalities with patients, families, other healthcare providers and administrators. Hospitalists can lead initiatives to improve communication among team members, patients, families, primary care physicians and receiving physicians within the hospital and at extended care facilities beginning with admission and through all care transitions. The hospitalist’s communication function extends to outpatient providers and the transfer of patient information. Studies indicate that information sent to outpatient care providers in a timely manner and with key content regarding patient care resulted in patients who were less likely to be re-hospitalized within 30 days (www.jointcommission.org/assets/1/6/TOC_Hot_Topics.pdf).

Delivering a quality discharge requires the commitment of the hospitalist and care team to implementing a quality discharge or transition summary on a timely basis. The Joint Commission Performance Measure for Heart Failure Discharge Instructions provides this description:

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

The rationale for this measure is described as:

- Patient non-compliance with diet and medications is an important reason for changes in clinical status. Healthcare professionals should ensure that patients and their families understand their dietary restrictions, activity recommendations, prescribed medication regimen and the signs and symptoms of worsening heart failure. National guidelines strongly support the role of patient education (Jessup, 2009 and HFSA, 2010).

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The Transitions of Care Consensus Coalition (TOCCC) listed in its Policy Statement brought forth by the American College of Physicians, Society of General Internal Medicine, Society of Hospital Medicine, American Geriatrics Society, American College of Emergency Physicians and the Society of Academic Emergency Medicine a proposed minimal set of data elements that should be part of a transition record and quality discharge⁹⁹:

- Principal diagnosis and problem list
- Medication list (reconciliation) including over-the-counter/herbals, allergies and drug interactions
- Clearly identifies the medical home/transferring coordinating physician/institutions and their contact information
- Patient's cognitive status
- Test results/pending status

The TOCCC recommended the following additional elements that should be included in an "ideal transition record" in addition to the above:

- Emergency plan and contact number and person
- Treatment and diagnostic plan
- Prognosis and goals of care
- Advance directives, power of attorney, consent
- Planned interventions, durable medical equipment, wound care, etc.
- Assessment of caregiver status
- Patient and/or family caregivers must receive, understand and be encouraged to participate in the development of their transition record which should take into consideration the patient health literacy and insurance status, and be culturally sensitive
- Define the communication infrastructure

7.7.1 Assessing Risk for Non-adherence (Addressed in Section 7.3.1)

7.7.2 Removing Barriers to Patient Non-adherence

Patients and family caregivers deal with barriers and factors associated with concerns from various adherence domains such as condition-related, therapy-related, patient- and family- related, social or economic factors, and health system or healthcare team related issues. The relationship between those domains can have significant complexity. It is critical for the care team to identify the areas that most negatively affect the patient's ability to adhere to his or her care plan and understand the necessary interventions and resources required to assist patients to engage with the team and improve non-adherence. Patient education, Teach Back options, reminders for appointment keeping, personalized written information about their treatment regimen and use of The Universal Patient Compact Principals for Partnership are all interventions for addressing non-adherence.

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Patients struggling with non-adherence may benefit from the care team or case manager using The Five Principles of Motivational Interviewing:

- Roll with resistance
- Express empathy
- Avoid argumentation
- Develop discrepancy
- Support self-efficacy

Motivation interviewing is also about informed choices. Since the patient is a partner in this process, it is critical that the patient understand the information provided and how it relates to his or her treatment options. Using various health coaching techniques is another resource to the care team in assisting patients to self-manage their care options.

A useful resource is the Patient Activation Measure (PAM). The PAM identifies where an individual falls within four different levels of activation. This gives providers and health coaches insight to more effectively support each individual. The shortened PAM has 13 questions and patients are scored as level one, two, three or four¹⁰⁰:

1. Does not yet believe they have active/important role
2. Lack confidence and knowledge to take action
3. Beginning to take action
4. Maintaining behavior over time

7.8 Outpatient Care Optimization and Communication with the Outpatient Care Team

Sharing of important care information among the patient, family caregivers and healthcare providers in a timely and effective manner is critical for HF patients. Effective outpatient care optimization should include a comprehensive approach for in-person contact and follow-up with the outpatient providers (either physicians or APRNs), close telephone follow-up, and intense self-care education and support. Heart Failure clinics and other health-coaching programs can provide on-going management, education and support of developing strong self-management skills for HF patients and their family caregivers. Telemonitoring may be ordered for outpatient care but should be augmented with comprehensive HF education and coaching.

Studies show the success of these interventions requires a communication infrastructure that will enhance communications with other healthcare providers about the patient's change of status. The process needs to provide timely feedback and feed-forward of information by utilizing specific communication models that support consistent and clear communication among healthcare practitioners and caregivers.¹⁰¹ The implementation of specific tools, i.e., Heart Failure Hospitalist Check List, Transfer Tool, Discharge/Transition Summary and The BOOST® Tools,¹⁰² can assist in timely communication and transfer of information.

7.8.1 Post-Discharge Phone Call and Contact Numbers

A post-discharge call should be scheduled with the patient and family during hospitalization to facilitate reaching the patient or caregiver via phone within 72 hours of discharge by clinical staff. The post-discharge follow-up call allows

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the patient's actions, questions and misunderstandings, including discrepancies in the discharge plan as well as any concerns from the family caregiver, to be identified and addressed. It is recommended that staff review¹⁰³:

- Health status
- Medicines
- Appointments
- Home service
- Plan for what to do if a problem arises

The Society of Hospital Medicine (SHM) recommends setting a timely follow-up appointment with the patient's primary care provider (PCP). The timely follow-up visit to a PCP presents a critical opportunity to address the conditions that precipitated the hospitalization, to prepare the patient and family/caregiver for self-care activities, and to prevent unnecessary hospital readmissions. Studies demonstrate that increased PCP follow-up is significantly and independently associated with a decreased risk of hospital readmission, particularly among patients with chronic diseases like HF and COPD.

No consensus exists about how soon patients need to be seen after discharge from the hospital. One suggestion is to identify each patient's medical and social risks for readmission, and base the timing of follow-up on those risks:

- High-risk patients: Before discharge, schedule a face-to-face visit with the home care service or physician's office within 48 or 72 hours.
- Moderate-risk patients: Schedule a physician office visit within seven days.
- Low-risk patients: Schedule a physician office visit as deemed medically reasonable by the attending physician.

SHM's BOOST[®] Toolkit provides the following checklist for Follow-up Appointment Scheduling:

- Confirm patient's contact information including best and alternative phone numbers.
- Confirm patient's PCP and office number.
- Ask patient if anyone else (family member, friend, etc.) should be involved in scheduling.
- Ask how patient will get to and from physician's office.
- Determine what days or times work for scheduling appointments and which should be avoided.
- Identify if there are any potential problems keeping appointments; e.g., transportation or safety issues returning home late in the evening.

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7.8.2 Post-Discharge Appointment Time “In-hand” (Addressed in Section 7.8.1)

7.8.3 Cardiac Rehabilitation Referral

Cardiac rehabilitation (CR) reduces the risk of a future cardiac event by stabilizing, slowing or even reversing the progression of cardiovascular disease (CVD). Despite the benefits, CR remains underutilized. Among the reasons for low participation in CR are:

- The lack of referral
- A strong endorsement from the patient’s physician
- Limited or no health insurance
- Conflicts with work responsibilities and lack of program availability and access.¹⁰⁴

Today, CR represents more than an exercise program; it typically includes core components that aim to optimize risk reduction, foster healthy behaviors and compliance with these behaviors, reduce disability, and promote an active lifestyle for patients with CVD.¹⁰⁵ Consideration should be given to providing a cardiac rehabilitation referral to patients in both inpatient and out-patient settings.

7.8.4 Communication with the Outpatient Care Team (Addressed in Section 7.8)

7.8.5 Considerations for Home Health and Home Physical/Occupational Therapy

The Visiting Nurses Association provides guidance through its Blueprint for Excellence program on implementing “Best Practice” home care for HF patients. Its recommendation is a process identified as Frontloading. Frontloading is a strategy whereby the home health agency increases the visit frequency or services at the beginning of care in order to reduce the potential for unplanned re-hospitalizations.¹⁰⁶ Patients should be admitted to the home health service within 24 hours of discharge/transition to home and should receive at least two skilled nursing visits or at least one visit and one phone call within 48 hours of the home care admission. There may also be telehealth monitoring involved with home health services. Providers need to ensure that the home health agency receives the timely referral for home health and transfer of information to ensure their ability to implement home health services.

7.8.6 Considerations for Nursing, Skilled Nursing and/or Outpatient Hospice Care

Post-acute care is the skilled nursing care and therapy typically furnished after an inpatient hospital stay. It is provided in a variety of settings, including skilled nursing facilities (SNFs), inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs), and in patients’ homes by home health agencies (HHAs). Often provided with the goal of shortening a patient’s hospital stay, post-acute care is just one component of a broad care delivery continuum.¹⁰⁷

Hospitals may have a preferred network for Skilled Nursing Facility referrals. A referral to a post-acute care provider should take into consideration several key issues:¹⁰⁸

- Quality patient satisfaction
- Accessibility

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- Ease of referral/transition process
- Response to referral times
- Readmission prevention

Current Issues and Challenges in Post-Acute Care Transitions

[The Hospital Readmissions Reduction Program \(HRRP\)](#) mandated by the Patient Protection and Affordable Care Act prompts short-term acute care hospitals (STACHs) to partner with their SNF providers to reduce readmissions. Future payment reforms (e.g., bundling) will reinforce this by promoting across-setting accountability. These partnerships must address the daunting problems of the discontinuities created by facility-to-facility transfer of inpatients with multiple medical needs and the substantial decrement in clinical resources, including staff devoted to patient care at SNFs compared to STACHs.

Common errors can occur as a result of a few issues:

Communication Failures

- Inadvertent discontinuation of vital therapies such as antibiotics
- Unintentional discontinuation of chronic medications
- Not providing hard copies of Schedule II drug (narcotics, sedatives) prescriptions to the SNF may lead to prolonged delays in providing pain control for patients as Drug Enforcement Administration (DEA) policies prevent nurses from accepting voice orders for Schedule II drugs
- Not transferring advanced directive information may lead to violating patient treatment preferences

Partnerships between STACHs and SNFs can ameliorate the problems of poor care plan communication and reduced clinical resources at SNFs. Such partnerships are employing two critical strategies for improving transitions:

- Cross-continuum teams:
 - ✓ These teams represent joint quality efforts that ensure engagement from all the stakeholders needed to address this transition. They include membership from staff at the STACH and SNF including physicians caring for patients at the two sites (e.g., hospitalists and SNFists). The team determines mutual objectives and areas of collaboration.
- Rigorous process improvement:
 - ✓ The cross-continuum team becomes the nexus for rigorous process improvement aimed at creating interventions to improve the transition by addressing the common issues leading to patient care deterioration and subsequent STACH readmission. Using a structured approach, the team can implement and maintain QI in the two clinical settings. Anecdotally, the most success at reducing readmission rates occurs when local partnerships perform rigorous root cause analysis, failure modes and effects analysis, examine staffing at common times of transfers, evaluate and train frontline providers and then develop and maintain strategies targeting identified issues.

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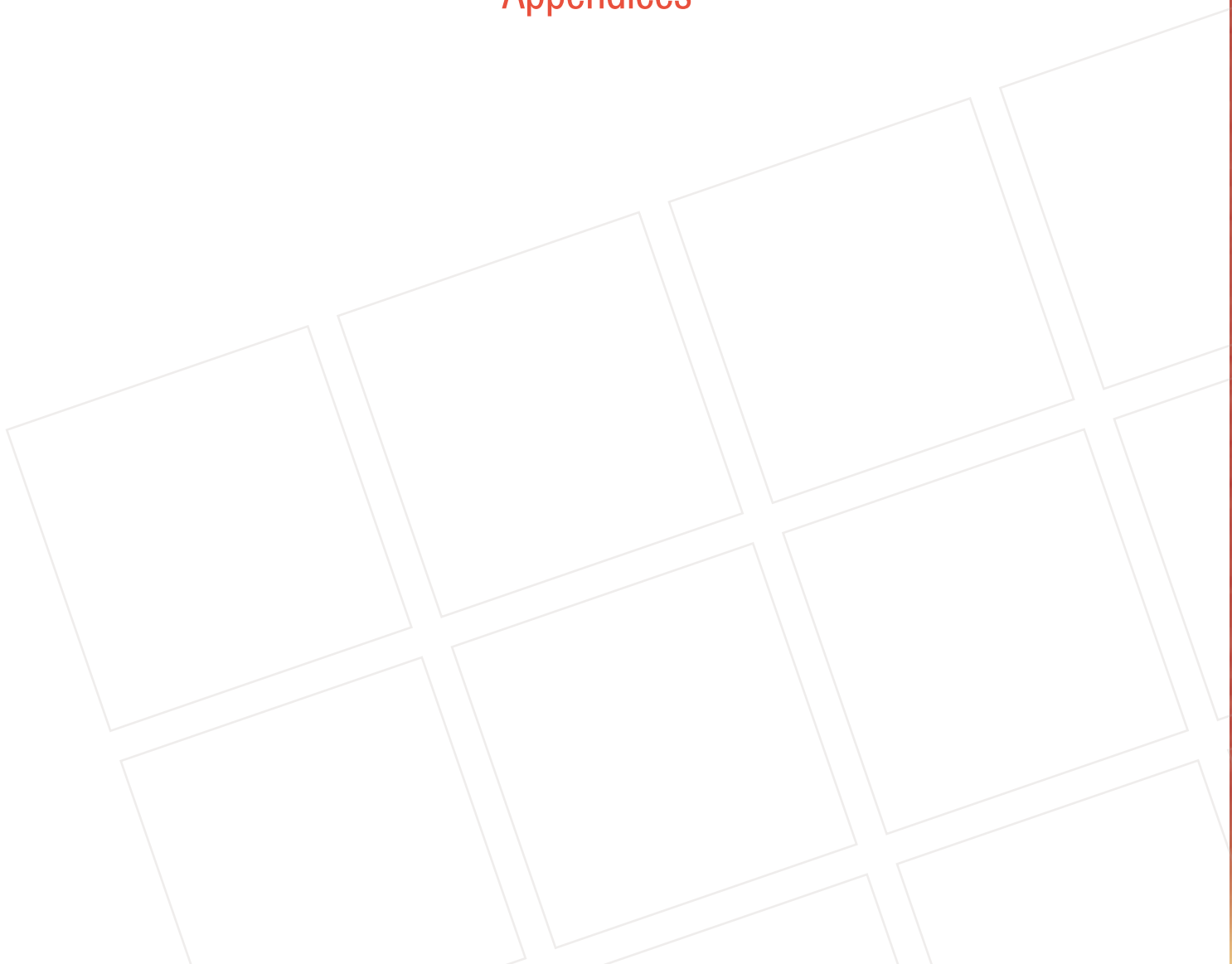
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Appendices



Obtaining Institutional Support

Your team needs support from your medical center leadership to enhance your improvement effort. Getting institutional buy-in and administrative support is essential. Ideally, you should use data already being collected to evaluate the care of patients with heart failure. Given the financial resources required to support a heart failure improvement effort, you should probably work on building the case for your heart failure improvement efforts, so you can argue that heart failure improvement efforts can be cost-effective. A direct line to administrative support for your effort, either by a direct reporting structure or by involving a senior administrator on the team, should be in place before you go any farther.

TASK Meet with members of your administration and have prepared “talking points” and, ideally, some preliminary information you have collected demonstrating the need for the administration’s attention. Convince your administrative leaders of the importance of supporting a program to improve heart failure care and core measure performance.

Task assignment _____ (TEAM LEADER)

Time line for completing _____

Stakeholder/Committee/Special Group Reporting and Approval Process

Identifying all the stakeholders and defining who needs to buy in and be aware of your efforts are important to increasing the likelihood of early adoption, to giving you legal protection for information you uncover and to planning educational efforts. Typically, this includes representation from:

1. Pharmacy and Therapeutics Committee
2. Pharmacists
3. Bedside nursing staff
4. Cardiologists
5. Hospitalists
6. Other internists
7. Heart failure nurses
8. Heart failure educators
9. Cardiothoracic surgery
10. Nutritionists/dieticians
11. Health information department (including those involved in core measure abstraction)
12. Hospital informatics
13. Home care
14. Data analysts
15. Emergency department

Each hospital team must decide who will be the key core members essential for the development and implementation of the heart failure team initiative. Other persons whose input will be required periodically may serve as ad hoc heart failure team members, for example, representatives from billing/coding services and finance.

Appendix B

TASK A

Identify key stakeholders, committees and special groups that need to be aware of your efforts to improve heart failure care. You also need to understand where your team fits into the organization's quality improvement structure. This understanding is critical, especially if barriers or issues that need broader organizational support are identified. In addition, clarifying this relationship will assist other QI teams and will help to standardize the approach to clinical care improvement.

Stakeholders:

Committees:

Special Groups:

TASK B

Clarify the reporting structure and approval process for your order sets, interventions and resource approval.

Reporting Structure:

Approval Process:

Assignment of Task 2A _____ (Team Leader)

Assignment of Task 2B _____ (Team Leader)

Time line for beginning and completing _____



Heart Failure Improvement Team Roster

Team leader (physician) Name _____ E-mail _____
 Phone _____ Pager _____

Team leader (nonphysician) Name _____ E-mail _____
 Phone _____ Pager _____

Team leader often, but not always, a hospitalist; in this instance could be a cardiologist.

Team facilitator Name _____ E-mail _____
 Phone _____ Pager _____

Content expert Name _____ E-mail _____
 Phone _____ Pager _____

Local expert with expertise in the management of heart failure and heart failure literature.

Hospitalist 2 Name _____ E-mail _____
 Phone _____ Pager _____

Hospitalist 3 Name _____ E-mail _____
 Phone _____ Pager _____

Internist/PCP Name _____ E-mail _____
 Phone _____ Pager _____

Home care Name _____ E-mail _____
 Phone _____ Pager _____

Pharmacist Name _____ E-mail _____
 Phone _____ Pager _____

Data analyst Name _____ E-mail _____
 Phone _____ Pager _____

Nurse supervisor Name _____ E-mail _____
 Phone _____ Pager _____



Nurse	Name _____	E-mail _____
	Phone _____	Pager _____
Heart failure educator	Name _____	E-mail _____
	Phone _____	Pager _____
Nutrition/dietary	Name _____	E-mail _____
	Phone _____	Pager _____
Case manager	Name _____	E-mail _____
	Phone _____	Pager _____
Cardiothoracic surgery	Name _____	E-mail _____
	Phone _____	Pager _____
ED personnel	Name _____	E-mail _____
	Phone _____	Pager _____
Patient rep (if team chooses)	Name _____	E-mail _____
	Phone _____	Pager _____
Health information	Name _____	E-mail _____
	Phone _____	Pager _____

Your team roster may vary from this, and you should be flexible as you address different aspects of achieving optimal care for the inpatient with heart failure.

Establishing Team Rules

At your very first team meeting, the team rules need to be established and everyone needs to explicitly agree to them. The facilitator is usually given the task of gaining consensus on and enforcing the team rules.

Use the team rules below as a starting point. The team should modify the rules as needed, then officially record and acknowledge them.

To some, these rules may appear a bit preachy. The key principle that must be maintained is this: everyone on the team must be encouraged to speak up, and their views must be respected. Traditional concepts of rank have to go “out the window.” A unit clerk should feel comfortable telling the lead physician, “I don’t think that will work because of [reason]. Why don’t we try it this way?”

In addition to these rules, it should be made very clear that potential members should notify the leader quickly if they cannot devote the requisite time and effort so that suitable replacements can be found. Timely minutes as well as quick turnaround for comments/corrections should be the rule.

TASK

Establish team rules and post a large, readable version at each team meeting.

Task assignment _____

(Team Facilitator)

Team Ground Rules . . .

- All team members and opinions are equal.
- Team members will speak freely and in turn.
 - We will listen attentively to others
 - Each must be heard.
 - No one may dominate.
- Problems* will be discussed, analyzed, or attacked (not *people*).
- All agreements are kept unless renegotiated.
- Once we agree, we will speak with “one voice” (especially after leaving the meeting).
- Consensus versus democracy, we each get our say, not our way.
- Silence equals agreement.
- Members will attend regularly.
- Meetings will start and end on time.

Establish General Aims

Establishing good goals is essential for maintaining focus and motivating the team.

Eventually your aims should be specific, measurable and time-defined and should specify the population or populations for whom you want to improve care. A “stretch” goal should be established that should be aggressive enough to mandate a change in the design of your current process in order to achieve it. Until you have reliable metrics and a baseline evaluation, however, team-supported general aims or goals can be important for galvanizing action and establishing clarity of purpose.

One important task is to define the scope of your efforts. Do you want to focus on just one ward or service? On just one group of physicians? For a one-month or three-month period? Again, a broad view of the scope of your efforts is encouraged as affecting all inpatients with heart failure, but it may be reasonable to start small and then spread your improvement methods to other areas. On the other hand, even if the scope of your effort includes all patients in your hospital or system, the interventions you choose should be piloted on a small scale when possible. The bottom line is this: think BIG! Initially, don't bite off more than you can chew, but serial testing and learning on a small scale can make even very large projects more manageable.

Examples of General Aims

1. General Aim 1: Substantially improve heart failure care for hospitalized patients.
2. General Aim 2: Decrease heart failure readmissions.
3. General Aim 3: Improve heart failure core measures.
4. General Aim 4: Increase the knowledge of caregivers about taking care of hospitalized heart failure patients.

As your team develops, your challenge will be to define many of the terms in your general aims, which will entail developing defined metrics and more mature, specific, time-defined aims. For example, what aspects of heart failure care do you want to improve first? What are the factors that lead to readmission? Which of the heart failure core measures needs the most improvement? How do we educate caregivers about heart failure care?

TASK: Establish General Aims.

General Aim 1 _____

General Aim 2 _____

General Aim 3 _____

General Aim 4 _____

Task Assignment: The Improvement Team

Due Date: First team meeting

TARGET:HFSM



Identify and Document Factors Contributing to Readmission

Identifying potential gaps in hospital, transitional, and post-discharge care for heart failure contributing to potentially preventable readmission can improve patient care and enhance quality improvement efforts.

Classification Of Readmission

	RELATED TO INITIAL ADMISSION	UNRELATED TO INITIAL ADMISSION
Planned Readmission	<input type="checkbox"/> Planned and Related	<input type="checkbox"/> Planned and Unrelated
Unplanned Readmission	<input type="checkbox"/> Unplanned and Related	<input type="checkbox"/> Unplanned and Unrelated

Preventable Readmission: Yes No Uncertain

Interval Between Hospital Discharge and Readmission _____ Days

Transition of Care

Interval Between Hospital Discharge and First Outpatient Visit _____ Days or No Visit

Interval Between Hospital Discharge and First Home Visit _____ Days or No Visit

Interval Between Hospital Discharge and First Telephone Contact _____ Days or No Contact

Identified Contributing Causes for Rehospitalization (check all that apply)

- Patient assessment breakdown¹
- Patient treatment breakdown²
- Patient and family caregiver breakdown³
- Handoff communication breakdown⁴
- Post-discharge from the hospital breakdown⁵
- No breakdown identified

¹ Examples of patient assessment breakdown include failure to assess for comorbid conditions and precipitating factors for decompensation of heart failure.

² Examples of patient treatment breakdown include non-adherence in providing guideline recommended therapies or treating comorbid conditions.

³ Examples of patient and family caregiver breakdown include lack of skill building, recommended target behaviors, or accounting for the literacy or cognitive status of the patient.

⁴ Examples of handoff communications can include failure to provide a discharge letter or patient letter that can be shared with the patient's primary care physician or specialists once discharged from the hospital or scheduling an early post-discharge follow up visit.

⁵ Examples of post-discharge from the hospital breakdown include failure to provide early follow up with the patient post discharge or check post discharge laboratories.

TARGET:HF™



TARGET: HEART FAILURE HEART FAILURE DISCHARGE CHECKLIST

Please complete all boxes for each HF indicator:

Admit Date: _____ Admit Unit: _____ Discharge Date: _____ Discharge Unit: _____
 Attending Physician: _____ HF Etiology: _____
 Follow-up appointment (date/time/location): _____

Complete All Boxes for Each HF Indicator	YES	NO	Reason Not Done/ Contraindications
Angiotensin-converting enzyme inhibitor (if LVSD)			<input type="checkbox"/> NA <input type="checkbox"/> CI
Angiotensin receptor blocker (if LVSD and ACEI not tolerated)			<input type="checkbox"/> NA <input type="checkbox"/> CI
β-Blocker (if LVSD, use only carvedilol, metoprolol succinate, or bisoprolol)			<input type="checkbox"/> NA <input type="checkbox"/> CI
Aldosterone antagonist (if LVSD, Cr ≤2.5 mg/dl in men, ≤2.0 mg/dl women, and patient's potassium and renal function will be closely monitored)			<input type="checkbox"/> NA <input type="checkbox"/> CI
Hydralazine/nitrate (if self identified African American and LVSD)			<input type="checkbox"/> NA <input type="checkbox"/> CI
Most recent left ventricular ejection fraction (_____ %) Date of most recent LVEF (_____) Method of assessment: <input type="checkbox"/> Echocardiogram <input type="checkbox"/> Cardiac catheterization <input type="checkbox"/> MUGA scan			
Anticoagulation for atrial fibrillation or flutter (permanent or paroxysmal) or other indications			<input type="checkbox"/> NA <input type="checkbox"/> CI
Precipitating factors for HF decompensation identified and addressed			
Blood pressure controlled (<140/90 mm Hg)			
Pneumococcal vaccination administered			<input type="checkbox"/> CI
Influenza vaccination administered (during flu season)			<input type="checkbox"/> NA <input type="checkbox"/> CI
EP consult if sudden death risk or potential candidate for device therapy			<input type="checkbox"/> NA <input type="checkbox"/> CI
Counseling			
Sodium restricted diet			
Fluid restriction (if indicated)			
Monitoring of daily weights			
What to do if HF symptoms worsen			
Physical activity level counseling			
Treatment and adherence education			
Enhanced HF education (at least 60 minutes by trained HF educator)			

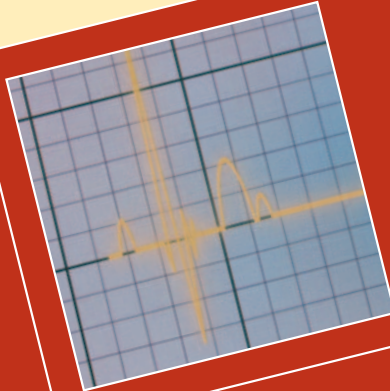
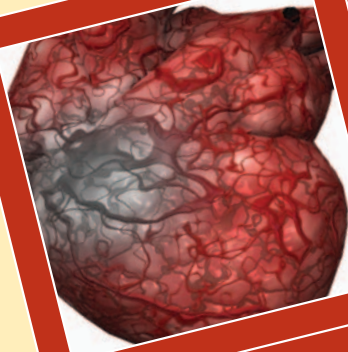
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The American Heart Association and the Heart Failure Society of America are working together to improve delivery of evidence based care for heart failure patients.





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