

Tackling Heart Failure As We Age

Best Practices in Heart Failure
Detection, Diagnosis, Treatment
and Care

Contents

Introduction & Context.....	3
Not a Normal Part of Aging.....	4
Understanding Heart Failure	5
The Need for Urgent Health Systems' Response to Heart Failure As We Age	7
Today's Path to Heart Failure Diagnosis, Treatment and Care	8
Key Challenges in Heart Failure Care	10
What Does Good Look Like? Core Features of Effective and Efficient Heart Failure Care	12
1. Enhancing Early Heart Failure Detection & Diagnosis Efforts	13
2. Empowering Patients Through a Life-Course Approach to Prevention, Detection & Management of Heart Failure.....	16
3. Bringing Together a Multidisciplinary Care Team	20
4. Embracing Innovative Care-Delivery Models Suited to Older Patients.....	24
Conclusion	27
Endnotes	29

Introduction & Context

More people die annually from cardiovascular disease than from any other cause.¹ As populations age, urbanization spreads, and the control of infectious and childhood diseases improves, cardiovascular disease prominence rises alongside things like high-fat diets, smoking, and sedentary lifestyles.² The global policymaking community and national health systems alike have taken notice of the existing major burden of cardiovascular disease and its projected growth and have embarked on dual-pronged prevention and treatment agendas to avert cardiovascular disease deaths and improve health and well-being for all. These increases, moreover, are expected to continue as global society ages even more dramatically – the global population over 60 is predicted to double by mid-century, reaching 2 billion, and for the first time in human history the will be more old than young in societies across the globe.

Existing efforts to combat cardiovascular diseases are realizing success—fewer and fewer people are dying prematurely as a result of heart attacks.³ In some European countries, heart attack deaths have been more than halved over the past 30 years.⁴ Despite advances in the prevention and management of many chronic conditions, such as hypertension, diabetes, and cancer, the medical community has been less successful in reducing mortality or hospitalizations attributed to heart failure. Perversely, falling mortality rates attributed to heart attack actually results in an increased number of long-term survivors of coronary heart disease that are likely to go on to develop heart failure.⁵

Not a Normal Part of Aging

The increase in CVD deaths during our current COVID-19 pandemic, because of the increased risk of contracting COVID-19 or because of the lack of or hesitation to seeking medical care, points to questions about optimal treatment and care. A 2019 clinical review in the United Kingdom is illustrative of stalled progress in heart failure care.⁶ The review showed that survival after a diagnosis of heart failure has only shown modest improvement in the 21st century and lags behind other serious conditions, such as cancer: overall, one, five, and 10 year survival rates increased by just 6.6 percent, 7.2 percent, and 6.4 percent respectively.⁷ In practical terms, this means that nearly one-third of patients hospitalized with heart failure are still expected to die within one year of their admission.⁸ As heart failure affects at least 26 million people around the world,⁹ it is notably one of the few cardiovascular conditions that is increasing in prevalence.¹⁰ Lending urgency to the challenge, the World Heart Federation's heart failure roadmap estimates that there are 11.7 million cases of undiagnosed heart failure globally.¹¹ Another major gap in detecting, diagnosing, and therefore treating heart failure is the subtle ageism that assumes symptoms of heart failure to be "normal parts of aging." A key to better treatment and care will be better awareness, detection, and diagnosis as we age.

"...heart failure affects at least 26 million people..."

"...there are 11.7 million cases of undiagnosed heart failure globally..."

Understanding Heart Failure

Heart failure is a progressive syndrome in which the heart's ability to effectively pump blood is impaired.¹² Today's medical definitions of heart failure are defined in "stages"—people with Stage A heart failure exhibit high risk of developing heart failure, but do not demonstrate symptoms, whereas patients with Stage D heart failure exhibit advanced structural heart disease and display symptoms even when they are at rest.¹³ The two most common types of heart failure are HFpEF—heart failure with preserved ejection fraction—and HFrEF—heart failure with reduced ejection fraction. Nearly all heart diseases, abnormalities, and structural defects can lead to eventual heart failure, as can diabetes, lung disease, obesity, sleep apnea, and drug or alcohol use.¹⁴

Heart failure usually develops gradually, so its signs are much less dramatic than those of other heart conditions; consequently, heart failure often goes unrecognized and untreated until it reaches an advanced stage.¹⁵ Typical heart failure symptoms include breathlessness, lack of appetite or nausea, rapid heart rate, ankle-swelling, fatigue, cough and lack of energy.¹⁶ Older adults with heart

failure generally experience symptoms for a relatively long time before a hospital admission.¹⁷ Frequently, older patients assume their symptoms are normal signs of aging. Patients over the age of 75, in particular, are likely to dismiss the physical symptoms of heart failure, resulting in delayed care-seeking or care-seeking

"Frequently, older patients assume their symptoms are normal signs of aging. Patients over the age of 75, in particular, are likely to dismiss the physical symptoms of heart failure, resulting in delayed care-seeking or care-seeking only at the point of crisis."

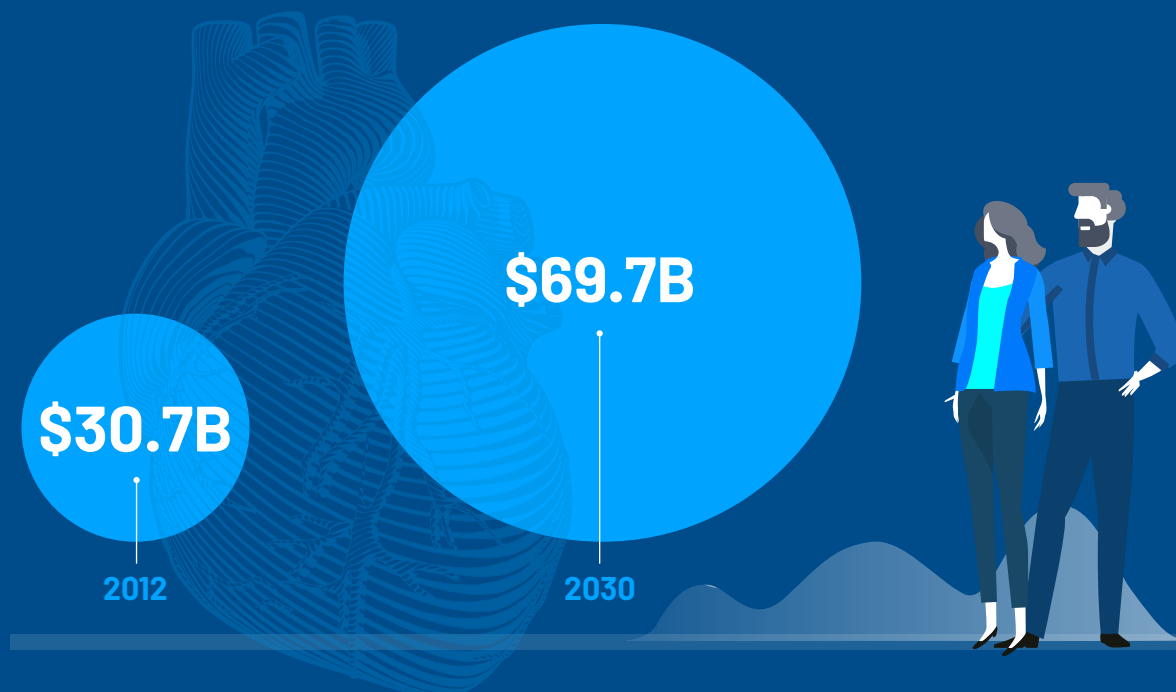
only at the point of crisis.¹⁸ Even health-care professionals themselves too often dismiss these symptoms as "normal parts of aging". The conditions and impact are further exacerbated as one ages: Decreased quality-of-life is common for people living with heart failure, and, as a person living with heart failure experiences more symptoms, the risk of developing depression rises.¹⁹

Heart failure is the most common diagnosis in hospital patients over the age of

65.²⁰ As such, it has an immense impact on quality-of-life for those living with the condition, their family members, and caregivers alike, and simultaneously exacts a tremendous financial toll on health systems and economies. In 2012 heart failure hospitalizations were responsible for an estimated health expenditure of around \$31 billion in the United States alone. Projections are even more alarming, with total costs expected to increase by 127 percent between 2012 and 2030.²¹

Despite the growing burden of heart failure and its associated economic impact, very few countries have specific national strategies in place to address heart failure.²² There are some examples of national programs or initiatives on heart failure, but most are in the context of broader national strategies around cardiovascular conditions and stroke, are unevenly financed, and often lack measurable targets.^{23, 24, 25, 26}

Total Cost of Heart Failure Predicted to Increase 127% by 2030



SOURCE: American Heart Association

The Need for Urgent Health Systems' Response to Heart Failure As We Age

Today, heart failure is present in 2 percent of people aged 40 to 59, and more than 5 percent of people aged 60 to 69.²⁷ In practice, this means that more than 80 percent of patients with heart failure are 65 years of age or older,²⁸ a statistic reflecting the number of heart failure patients diagnosed and recorded—with diagnosis often coming on the occasion of hospitalization. Earlier diagnosed and managed heart failure is far less likely to lead to hospital admissions—yet, the National Audit of Heart Failure in England and Wales, the world's largest heart failure audit, shows a steady increase in hospital admissions with a primary diagnosis of heart failure over the last decade.²⁹ The average age of a patient admitted with a primary diagnosis of heart failure ranges from 70 to 75 years.³⁰ As populations age, we can expect heart failure prevalence and hospitalizations to continue to rise, demanding health system action.

Health systems are missing out on timely diagnostic windows for patients either living with heart failure or at high-risk of heart failure, meaning that by the time heart failure is recognized and diagnosed, it is often too late for patients to benefit from effective long-term management approaches, including lifestyle modifications and the use of evidence-based treatments.³¹ If a patient's heart failure goes unrecognized until it becomes acute—which is so often the case for patients over the age of 50 with heart failure—the window for action is incredibly limited: a delay in hospital treatment as little as four-to-six hours after acute onset of heart failure symptoms can increase a patient's risk of death.³²

“Targeting patients at risk of heart failure at the age of 50 provides health systems with a 20-year window to maximize detection and begin evidence-based lifestyle and medical interventions to reduce and delay costly hospitalizations and improve quality-of-life...”

Once a patient is diagnosed, adherence to evidence-based treatment guidelines is imperative to ensuring optimum outcomes—this is true regardless of the patient's age. Illustrating the importance of guideline adherence, the results of one nation-wide study in the United Kingdom suggest that one-in-four heart failure hospital admissions might be prevented, or delayed, through the appropriate use of ACE inhibitors.³³

The vast majority of heart failure patients are over the age of 50, and become much more difficult to diagnose, treat, and manage once they reach the age of 70, because of increased rates of frailty, cognitive impairments, and co-morbidities that complicate the diagnostic presentation of heart failure³⁴ and raise challenges in managing poly-pharmacy needs.³⁵ Targeting patients at risk of heart failure at the age of 50 provides health systems with a 20-year window to maximize detection and begin evidence-based lifestyle and medical interventions to reduce and delay costly hospitalizations and improve quality-of-life for patients over the age of 50 and beyond. In fact, evidence indicates that cost effectiveness of guideline adherence is greatest in patients over the age of 50.³⁶ Today's diagnostic and treatment landscape has unlocked the potential of earlier diagnosis through the use of natriuretic peptide testing and optimized treatment through medications that improve cardiac muscle performance, as decreased performance is correlated with age and most often begins at age 50.³⁷

Once heart failure patients reach the age 70, diagnosis and management needs to be further modified to meet the unique needs of this cohort—for example, screening questions ought to be modified to account for potentially lower levels of activity, and treatment protocols ought to be integrated into the larger landscape of the patients' care, taking into account the multiple co-morbidities common in this age group.

Today's Path to Heart Failure Diagnosis, Treatment and Care

Healthcare providers and the general public alike conflate heart failure's prevalence in older people dismissively as a normal consequence of aging.³⁸ This inaccurate conflation has proven dangerous for people living with heart failure and their families—and to the growing aging population worldwide—increasing the risk of both missed diagnoses and of inadequate care provision and coordination. The application of evidence-based protocols for the diagnosis and treatment of heart failure is paramount to ensuring that patients receive optimum care, and studies show that these guidelines are relevant to patients of all ages.³⁹

Diagnosing heart failure remains, to some extent, a subjective judgment. Clinicians will measure a patient's blood pressure and heart rate and will issue blood tests and question patients to evaluate symptoms.⁴⁰ The diagnostic process is the same regardless of a patient's age, but is often more challenging in older populations because comorbid conditions may mimic heart failure or generally complicate the patient's clinical presentation.⁴¹ If the physical examination and blood tests suggest potential heart failure, the suspicion can be confirmed via an echocardiogram.

Echocardiograms can help to identify the "phenotype" of a patient's heart failure—the phenotype is simply the specific type of dysfunction that characterizes the patient's heart failure. This diagnostic procedure can identify whether the patient is suffering from HFpEF or HFrEF, a distinction that is critical to the optimum application of heart failure treatments.⁴² Unfortunately, evidence suggests that the proportion of patients with adequately diagnosed and phenotyped heart failure and on guidelines-indicated pharmacological and non-medical therapy, such as the implantation of a device, is just a fraction of what it should be.⁴³

Once a patient is diagnosed, there are a number of pharmacological and non-pharmacological treatments available that have been proven to improve patient quality of life, physical functioning, and overall well-being.⁴⁴ To that end, the utilization of evidence-based national clinical guidelines is central to heart failure care and treatment.⁴⁵ Evidence-based pharmacologic therapy is the typical first-line treatment for heart failure patients, including those over the age of 50—treatments include ACE inhibitors, beta-blockers, nitrates, and diuretics.⁴⁶ And, non-pharmacological treatments are also utilized; non-pharmacological care for heart failure includes the revascularization of arteries, the repair of valves, the implantation of a pacemaker or cardioverter-defibrillator, and cardiac resynchronization.⁴⁷

The medical treatment of heart failure recommended for patients over the age of 50, and even over the age of 70, is not significantly different from that recommended in younger patients. However, these treatment recommendations remain largely empiric because clinical trials have historically excluded people over the age of 70 and people with comorbid conditions⁴⁸—a blatantly ageist approach to healthcare. A 2017 clinical review confirmed that while older patients are less represented in clinical trials, all

heart failure therapies from drugs to devices are still recommended in this population.⁴⁹ The study's only caveat was that the best treatment is one that is personalized and grounded in patient preference, considering aspects beyond heart failure such as comorbidities, frailty, social, and economic background and quality of life.⁵⁰

Key Challenges in Heart Failure Care

Challenges in heart failure management begin with better monitoring, which leads to earlier detection and diagnosis—patients and health care providers both need to improve their ability to identify heart failure symptoms, to ensure that treatment can be initiated as early as possible in the disease's progression. Across Europe, only 3 percent of people can properly identify the main symptoms of heart failure;⁵¹ and, once patients notice their symptoms and present to a care provider, evidence suggests that the appropriate and timely application of diagnostic tests is uneven. A 2018 study in Copenhagen examined 400 patients over the age of 60 with risk factors for heart failure, but without known heart failure. Following examination, more than half of the patients were diagnosed with either stage B or C heart failure.⁵² Had these patients been issued an echocardiogram, or natriuretic peptide testing, they could have received a medication protocol earlier within the progression of their heart failure—

“...the earlier application of evidence-based treatment is proven to prevent hospitalizations, prolong life, and improve patient well-being. And, crucially, flagging patients for treatment initiation, or enhanced monitoring, while they are between the ages of 50 and 70 enables care providers to make a diagnosis before an enhanced risk of co-morbidities complicates the diagnostic picture...”

the earlier application of evidence-based treatment is proven to prevent hospitalizations, prolong life, and improve patient well-being. And, crucially, flagging patients for treatment initiation, or enhanced monitoring, while they are between the ages of 50 and 70 enables care providers to make a diagnosis before an enhanced risk of co-morbidities complicates the diagnostic picture, and to coach patients on embedding lifestyle changes and self-management techniques into their day-to-day routines before conditions like frailty or vision deterioration make the adoption of such tactics more complicated.

Once patients are diagnosed, the management of heart failure remains fragmented. In particular, there is a lack of cohesive interaction between primary care or geriatrics, where heart failure care is often centered and co-morbidities are managed, and specialist cardiologist input.⁵³ Unsurprisingly, the fragmented care pathways that heart failure patients are subjected to lead to higher costs and unfavorable care outcomes: readmission rates are high after hospitalization due to heart failure deterioration, with about one-quarter of patients being readmitted within one month.⁵⁴ Continuity of care is most at risk during the patients' transition from an institutional care setting to the home.⁵⁵ One study showed that one-third of discharged patients lacked knowledge about which health care provider to contact in the event of deterioration or complications.⁵⁶

Finally, the uptake of guideline recommendations that improve heart failure outcomes remains nearly universally suboptimal.⁵⁷ An international study conducted across 36 countries revealed that nearly half of patients observed were not meeting their target dose of guideline-recommended medication.⁵⁸ Another nationwide study in Sweden suggests that guideline-adherence is also a challenge in the appropriate use of medical devices.⁵⁹ One possible explanation for the under-utilization of clinical guidelines may be that introduction and up-titration of ACE-inhibitors and beta-blockers as a patient's heart failure progresses can be time-consuming tasks that are often difficult for physicians or clinics not dedicated to heart failure care.⁶⁰

What Does Good Look Like?

Core Features of Effective and Efficient Heart Failure Care

As the prevalence of heart failure will increase with the aging of the population, it is imperative for policymakers, medical professionals, health systems, and other leaders pursuing healthy aging to recognize the value of better heart failure diagnosis and care—and to take action accordingly to improve the lives of those living with and at risk of heart failure.

Better Detection & Earlier Diagnosis

Maximize opportunity to provide patients with life-prolonging medication through earlier HF detection and diagnosis

Life-Course Approach

Empower patients through a life-course and person-centered approach to care, emphasizing prevention, early detection, and patient engagement in treatment and management efforts

Multidisciplinary Care Teams

Address varied and changing needs of people living with HF by deploying a multidisciplinary management approach, including the use of HF clinics

Innovative Care-Delivery Models

Embrace innovative care-delivery models suited to older patients, including digitally enabled self-care and self-monitoring at home

1. Enhancing Early Heart Failure Detection & Diagnosis Efforts

Early detection is key in heart failure, as putting patients on appropriate treatment as early as possible is vital to help minimize the risk of their heart failure symptoms getting worse, prolong their lives, and improve their quality of life. Further, both diagnosis and management of heart failure become more difficult once patients reach the age of 70; early detection in patients between the ages of 50 and 70 maximizes the opportunity to provide patients with life-prolonging medication that is more effective when initiated early in the natural progression of heart failure.⁶¹

WHAT CAN BE DONE?

Enable the health system to more effectively adhere to guidelines. It is important that national healthcare systems provide appropriate reimbursement for guideline-recommended diagnostics and ensure their widespread accessibility.⁶² Additionally, there are a number of viable approaches for improving early detection and diagnosis, spanning from low-cost, easily implementable changes to patient interview techniques, to more sophisticated diagnostic approaches involving the use of natriuretic peptide testing to help identify those at highest risk of heart failure before the onset of the symptomatic phase of the disease. The World Heart Federation's heart failure roadmap recommends screening for asymptomatic left ventricular dysfunction in high-risk individuals to help maximize the number of patients reached with guideline-based interventions.⁶³ Further, two major studies thus far show promising results on the use of natriuretic peptide testing to help identify those at highest risk of heart failure and targeting treatment to these groups. Patients with an elevated level of natriuretic peptides can be prescribed additional or more regular diagnostic tests for heart failure and angiotensin receptor blockers, resulting in fewer hospitalizations and cardiac events.^{64, 65}

Adapt standard protocols to include the needs of the aging population. By slightly altering the standard line of patient questioning used to elicit whether or not heart failure symptoms are present, clinicians could more readily identify cases of heart failure for timely treatment. For example, breathlessness upon exertion is one of the earliest and most easily recognizable symptoms of heart failure—clinicians typically ask patients “do you get short of breath after walking a block?”⁶⁶ However, this question might not be applicable to older patients whose activity-levels may be restricted by things like arthritis or coronary artery disease. For these patients, it is more productive for clinicians to ask things like, “do you get short of breath after making the bed or changing clothes?”⁶⁷

Utilize data and predictive analytics to identify heart failure earlier. Another intervention for improving early detection that requires little additional investment is the analysis of health data captured in electronic health records to identify patients at high risk of developing heart failure. In fact, a study published in 2017 demonstrated that such analysis may be able to facilitate the detection of heart failure as early as two years prior to diagnosis.⁶⁸

CASE STUDY



Screening for Early Detection, Reduced Admissions and Cost Savings: The Heartbeat Trust’s STOP-HF Initiative^{69,70}

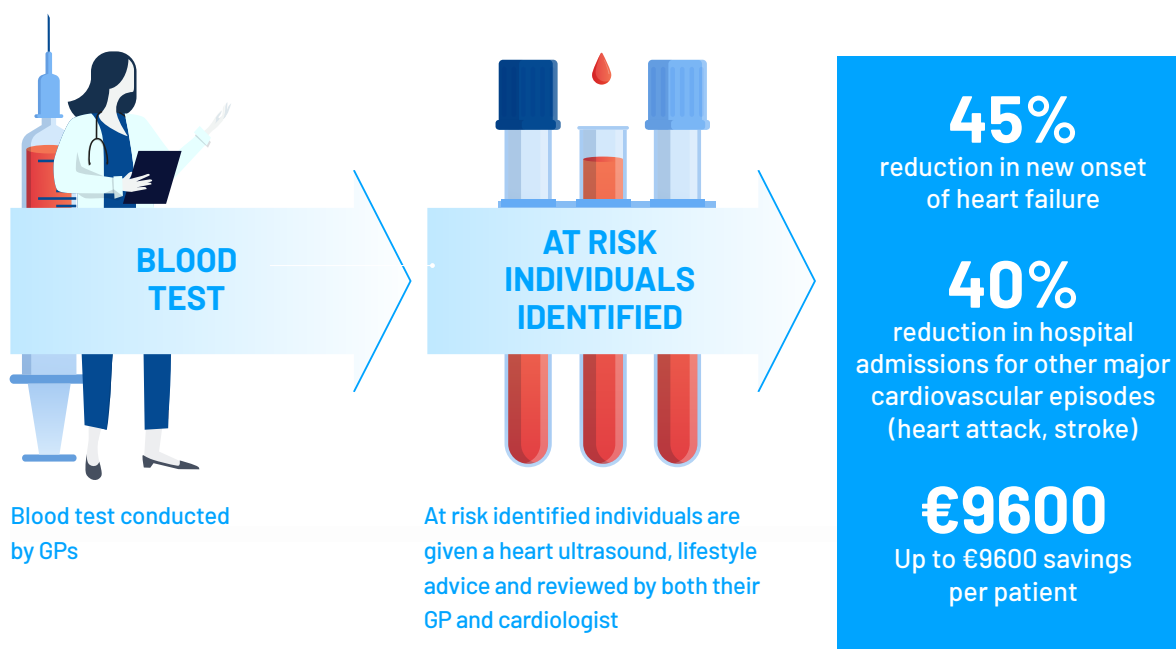
Ireland

The Heartbeat Trust’s landmark STOP-HF (Screening TO Prevent Heart Failure) study used a simple blood test, conducted by general practitioners, to help identify those most at risk of heart failure. The program targeted people over 40 with a cardiovascular risk factor, such as high blood pressure or diabetes. Participants shown to have an elevated level of natriuretic peptide, a protein released by the heart when it is under stress or strain, through the blood test (BNP-based screening) were then given a heart ultrasound, lifestyle advice and reviewed by both their GP and cardiologist.

Overall, the program showed that among patients at risk of HF, BNP-based screening and collaborative care reduced new onset of heart failure by 45%⁷¹ and reduced hospital admissions for other major cardiovascular episodes, including heart attack or stroke, by as much as 40%. As a result, costs were reduced—as much as €9600 per patient—through the prevention of left ventricular failure and other major adverse cardiac events.⁷²

STOP-HF has been recognized internationally, winning numerous awards and adoption into international guidelines, and is now a routine clinical service along the East Coast and Midlands supported by The Heartbeat Trust.

Early Indication Blood Tests Shown to Improve Heart Failure Detection, Decrease Hospitalization and Save Money



2. Empowering Patients Through a Life-Course Approach to Prevention, Detection & Management of Heart Failure

Today, heart failure is largely considered a condition of aging to be reactively managed by a cardiologist or geriatrician. However, people with heart failure would benefit immensely from a life-course and person-centered approach to care that emphasizes prevention, early detection, and patient engagement in ongoing treatment and management efforts. In fact, the Heart Failure Policy Network asserts that people with heart failure who are empowered and receive sufficient support to undertake self-care and management practices are at a lower risk of hospital readmission and depression.⁷³

WHAT CAN BE DONE?

Increase public engagement in healthier lifestyles. The risk of developing heart failure can be reduced by as much as 80 percent through the adoption of healthier lifestyles and treatment of cardiovascular risk factors, but the public's knowledge of the links between heart failure and lifestyle choices remains limited.⁷⁴ To help boost patient engagement in prevention activities, primary care providers can be actively involved by controlling risk factors and providing education in self-management skills.⁷⁵ Building public awareness is critical and should extend beyond the rooms of the primary care examination room. Indeed, some countries are already investing in this type of effort. For example, in Croatia, the Heart Failure Association hosts "Heart Failure Awareness Days" that fund coordinated media education programs and include "open door" events at heart failure clinics during which patients can come in for advice and screenings.⁷⁶

Provide clear disease-management and self-care instructions, especially at discharge.

Heart failure is a long-term condition—or rather, it has the potential to be a long-term condition if properly managed. A key goal of care must therefore be to help patients engage in their care and maintain as good a quality of life as possible over the course of their condition. Patient engagement is crucial to preventing hospital readmissions—around 50 percent of heart failure readmissions are due to preventable factors such as non-compliance with medication or diet, inadequate discharge planning, or a failure to observe worsening symptoms.⁷⁷ To prevent hospital readmissions and improve patient quality of life, people living with heart failure need personalized care plans tailored to their individual needs, with an emphasis on empowering patients to engage in self-care activities.⁷⁸ Indeed, evidence has shown that patients who are discharged from the hospital with a clear discharge and follow-up plan have a lower risk of being re-admitted to the hospital or dying within one year.⁷⁹

Health care providers have a key role to play in empowering patients: clinicians can deliver heart failure education by explaining the condition and by teaching patients to recognize early symptoms.⁸⁰ Self-management of heart failure can also help to equip health care providers with valuable information for tweaking treatment protocols—for example, patients ought to be instructed to weigh themselves daily to monitor for signs of fluid retention, and to keep a symptom log.⁸¹

Tailor self-management protocols to align with the needs and chronic disease risk of each individual.

Once a treatment plan has been designed, health care providers should support patients in developing the skills necessary to adhere to their medication regime and any dietary or lifestyle changes. Such self-management programs targeted at older adults and patients with advanced disease have been proven to improve quality of life and functional status, decrease hospitalizations, and reduce medical costs.⁸² Further, any patients with heart failure over the age of 50 should be educated on the importance of seeking immunization against diseases like influenza and pneumococcus.⁸³ If patients exhibit visual impairments or memory issues, the use of computers with touch screens or short booklets with enlarged text and repetitive teaching have been shown to help improve self-management of heart failure.⁸⁴

CASE STUDY



Education and Support With Follow-Up: Dignity Health St. John's Hospitals' Heart Failure Program^{85,86,87}

United States

The Heart Failure (HF) Program at St. John's Regional Medical Center and St. John's Pleasant Valley Hospital in California provides education and support to heart failure patients and family members to help them maintain the highest quality-of-life and reduce their risk of being readmitted to the hospital or emergency department. In addition to comprehensive discharge instructions, the program provides: 1) home health follow-up (when applicable), 2) cardiac rehabilitation, and 3) access to its Congestive Heart Action Management Program® (CHAMP®). Nurses recommend patient participation in one or more of the program's levels, as well as numerous free services offered by St. John's, based on a tailored evaluation. The program includes consistent telephone follow-up with education and coaching to ensure ongoing patient engagement, thereby decreasing the number of readmissions to all hospitals, and reducing resource utilization.

Evaluation of the CHAMP program alone showed that 97.4 percent of participants were neither readmitted to the hospital nor had an emergency department visit within 90 days of completing the program. Elements continue to be added to the program, including a web-based business intelligence platform and the development of an outpatient hospital-to-home clinic, which have resulted in a significant reduction of length of stay, clinic resource utilization, and readmissions.⁸⁸ Simultaneously, program leaders continue to provide ongoing education for staff and health care providers about the value of the HF Program. They also plan to increase enrollment of underserved communities and collaboration with community organizations to continue reducing avoidable hospital admissions and readmissions for enrolled participants.

Congestive Heart Action Management Program® (CHAMP®) Effectiveness



Through education, support, and follow-up, 97.4 percent of participants in CHAMP were neither readmitted to the hospital nor had an emergency department visit within 90 days of completing the program.

3. Bringing Together a Multidisciplinary Care Team

Optimized heart failure management in older adults is built upon a multidisciplinary care team led by clinicians with specialized training in cardiology; the Heart Failure Policy Network's recommendations tell us that multidisciplinary teams can meet the varied and changing needs of people with heart failure and their families, and can help to ensure seamless transitions and closely coordinated treatment efforts.^{89,90} Because heart failure can be exacerbated by factors such as weight and diet, and can impact a patient's mental health and physical abilities, it requires a multidisciplinary management approach bringing together diverse care providers. Internists, primary care providers, cardiologists, psychologists, physiotherapists, geriatricians, nurses, dieticians, social workers, pharmacists, and palliative care specialists all play important roles in caring for older people living with heart failure.⁹¹

WHAT CAN BE DONE?

Place a heart failure specialist at the head of the team. Given the complexity of administering ongoing treatment for heart failure, it is critical that a clinician with subspecialty training in heart failure take the lead in guiding the multidisciplinary care team. Illustrating the importance of including clinicians with cardiology training in heart failure management, a study in the United Kingdom revealed that non-cardiologists are less likely to use all of the disease-modifying drugs for heart failure, such as ACE inhibitors and beta-blockers.⁹² A multidisciplinary approach to heart failure management has been shown to increase adherence to clinical guidelines, a central component of heart failure care that remains under-adopted.⁹³ Multidisciplinary care teams that are led by either pharmacists or nurses with a heart failure specialty have been proven to most successfully improve target dose prescriptions.⁹⁴

Recognize and maximize the important role of heart failure nurses. Regardless of care team composition, heart failure nurses play a vital role, acting as a key liaison for patients and ensuring continuity and seamless transitions across their entire care pathway.⁹⁵ Working with these nurses who have received specialist training in heart failure has been shown to enhance heart failure patients' quality of life and adherence to treatment, and is thought to be a cost-effective long-term investment by preventing crisis hospital admissions.⁹⁶ Heart failure nurses can improve care transitions by reconciling a patient's medications,⁹⁷ liaising with primary care providers on discharge summaries and heart failure treatment plans, and undertaking direct follow-up communications once a patient is discharged from the hospital.⁹⁸

Rapidly scale the proven heart failure clinic model. One proven approach for providing optimal care and follow-up to heart failure patients is through the institution of dedicated outpatient heart failure clinics. Heart failure clinics utilize a number of different care models—they can either be physician-directed or nurse-led and sometimes also include patients with chronic diseases (such as diabetes or chronic obstructive pulmonary disease) or diagnostic units for rapid echocardiographic evaluation of patients with suspected heart failure.⁹⁹ Best-in-class heart failure clinics have the following attributes: conducting a wide variety of interventions, in particular the up-titration of beta-blockers and ACE-inhibitors, in consultation with pharmacists; patient and caregiver education and promotion of self-care and monitoring; physical training programs directed by physical therapists; and emotional and support services provided by nurses or social workers.¹⁰⁰ Heart failure specialist nurses or cardiologists meet with patients every two or three months to detect early symptoms of worsening heart failure and to optimize medical treatment to prevent the need for hospitalization.¹⁰¹ Other clinicians may liaise with patients more frequently both in-person or over the phone to provide coaching on nutrition, physical activity, and mental health.

Heart failure clinics are especially useful for managing patients over the age of 50 at high-risk of heart failure, recently hospitalized patients, and elderly patients with multiple active comorbidities.¹⁰² Regardless of target patient population, multidisciplinary heart failure clinics are proven to reduce both mortality and hospital readmissions,¹⁰³ and have a favorable impact on quality-of-life and care costs.¹⁰⁴

CASE STUDY



Multidisciplinary Care Linking Hospital and Community Resources^{105,106}

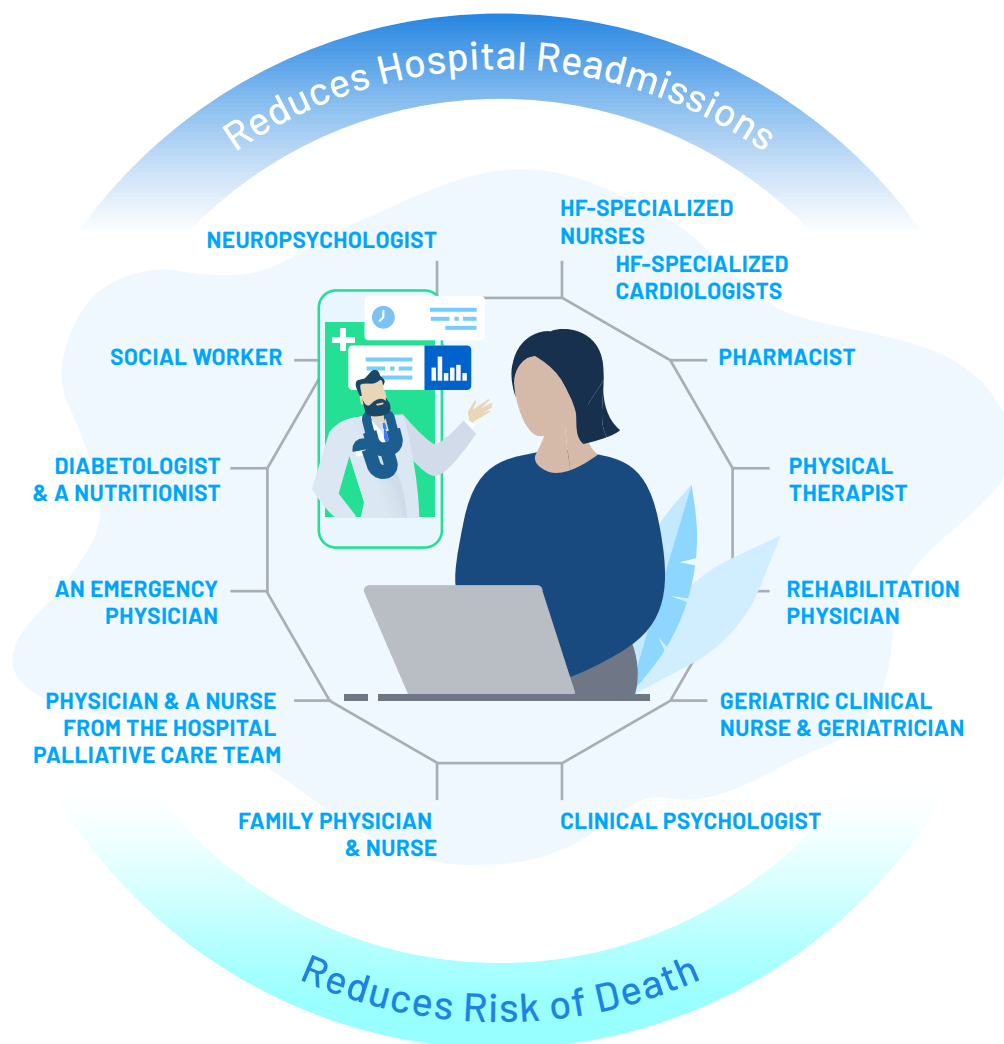
Spain

Healthcare institutions in the Litoral Mar area in Spain and the Catalan Health Service developed a multidisciplinary and integrated heart failure care model for primary care. Following discharge from an acute heart failure episode in any hospital in Catalonia, patients are admitted to a nurse-led multidisciplinary program, integrating hospital and community resources. Since the program began in 2005, a telemonitoring component has been added to track daily signs and symptoms of worsening heart failure, which leads to follow-up by means of video or audio conference as needed.

The multidisciplinary care team includes cardiologists and nurses specialized in HF, pharmacists, physical therapists, a rehabilitation physician, a geriatric clinical nurse and geriatrician, neuropsychologists, a clinical psychologist, a social worker, a nutritionist, a diabetologist, an emergency physician, and a physician and a nurse from the hospital palliative care team, as well as family physicians and nurses in charge of coordinating patient care between the HF unit and primary care practitioners.

Evaluation of the program has shown reduction in hospital readmissions and deaths linked to heart failure. Patients in the program had a 31.3% rate of readmission for HF, compared to 33.8% for patients not involved in the program. Risk of death reduced from 54% to 50% for patients involved in the program. These findings show that implementation of multidisciplinary heart failure management programs that integrate the hospital and the community is feasible and is associated with a significant reduction in patient morbidity and mortality.^{107,108,109}

Nurse-Led Multidisciplinary HF Care Puts Patient at the Center



4. Embracing Innovative Care-Delivery Models Suited to Older Patients

Relatively high-touch outpatient care, based on interactions with nurse specialists every two to three months, is proven to improve heart failure care in patients of all ages. This type of vigilant management is especially useful in older patients who may be living with multiple chronic conditions.

WHAT CAN BE DONE?

Utilize home-based interventions to ensure continuity of care. In settings where a heart failure clinic model is not feasible due to either resource constraints or dispersed patient populations, a nurse-based home-visit strategy for managing heart failure patients offers a promising alternative. Home-based interventions are well-suited to older patients living with frailty or reduced mobility as it eliminates the need for regular travel to a clinic site. A trial in Brazil, aimed at patients over the age of 60, utilized nurse-led home-visits and telephone conversations to enhance patients' understanding of heart failure and self-care tactics, and to improve adherence to evidence-based care recommendations.¹¹⁰ Within six months of follow-up, the program resulted in a 27 percent relative reduction in the combined clinical endpoint of hospital admissions, emergency visits, or death. And, significantly, the nurse-led interventions promoted a better understanding of the condition associated with increased self-care actions.¹¹¹

Leverage technology for remote monitoring, patient education, and more coordinated care. Innovations in digital health promise to unlock some of the benefits of heart failure clinics or nurse home-visits for all people living with heart failure. Digital innovations are well-suited to facilitating patient self-care or self-monitoring of their condition, while boosting convenience and accuracy. In France, a digital communications tool is being used to enable the remote monitoring of heart failure through at-home devices such as weight scales, blood pressure monitoring devices, and a three-channel ECG.¹¹² All of these tools are connected to a web-platform that allows the information

to be shared with remote clinicians for evaluation.¹¹³ A similar program in Germany that also included patient education modules demonstrated a reduction in hospitalizations and all-cause death amongst program participants.¹¹⁴

CASE STUDY



Smarter HF Management Through Tele-Coaching and Telemonitoring^{115,116,117}

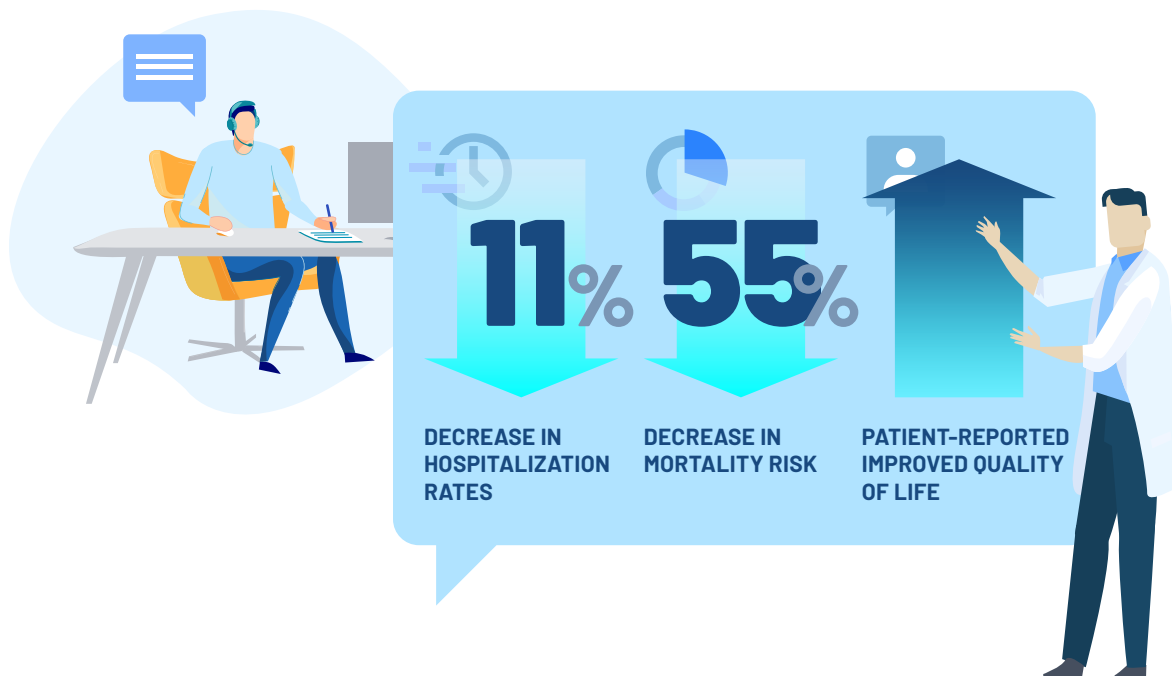
Germany

Mecor®, a program initiated by Novartis and KNAPPSCHAFT with the service provider Health Care Systems GMBH, offers tele-coaching and telemonitoring services for patients with congestive heart failure (CHF). The tele-coaching services include education, advice, and personalized coaching. The telemonitoring services include structured telephone support and a connected scale.

Participants weigh themselves every morning on a special scale, which sends data to the telemonitor. Patients can also register any symptoms by answering yes/no questions on the monitor, and if the algorithm detects worsening disease, it sends a signal to a trained nurse. The nurse then decides whether it is necessary to contact the patient to assist with medication adherence or assess the need to see a doctor. Rather than only relying on the individual and irregular assessment of a nurse, mecor® applies an algorithmic approach that deploys tele-coaching at the right time to improve outcomes.

Through the program, relative hospitalization rates (all cause) decreased on average 11%, and relative mortality risk (all cause) decreased 55% on average. Patients also reported improved quality of life.

Tele-coaching and Telemonitoring to Engage Patients and Improve Quality of Life



Conclusion

Prevalence of heart failure is growing as populations age, and, perhaps more concerning, hospitalizations are increasing even while hospitalizations for other chronic conditions are decreasing. In the United Kingdom, alone, heart failure accounts for 1 million inpatient bed days per year.¹¹⁸ Rising hospitalization related to heart failure can be understood as a proxy measure for the quality of heart failure care. Indeed, if a patient's heart failure goes unrecognized or undertreated and the patient is admitted to the hospital with acute symptoms, there is a significant chance that they will go on to die from the condition within a year.¹¹⁹

Adherence to evidence-based clinical guidelines, effective care coordination, patient empowerment in self-management, and the utilization of a multidisciplinary care team underpin successful heart failure management in all populations, regardless of age. However, there are adjustments that health systems can make to their heart failure care approaches to specifically meet the needs of patients over the age of 50. Specific care considerations for this patient cohort begins with better education, screening, and detection efforts.

Then, once a patient receives a diagnosis, clinicians should undertake screening for any cognitive impairments, which can have an impact on a patient's ability to undertake self-care for heart failure, when building a treatment and care management plan.¹²⁰ Clinicians should adhere closely to clinical guidelines in prescribing pharmacological and

non-pharmacological treatments, though heart failure medications in frail older patients may be introduced at lower doses and titrated more gradually.¹²¹ Finally, the adequate management of comorbidities is absolutely central to effective heart failure care. In older people with heart failure, independent risk factors that increased the occurrence of hospitalizations include diabetes, chronic kidney disease, and depression.¹²²

By adopting a comprehensive and integrated approach to heart failure care, health systems can capitalize on the 20-year diagnosis and treatment window and effectively identify heart failure patients and initiate evidence-based, effective treatment plans before patients reach the age of 70 and become more challenging to both diagnose and manage. By doing so, we can provide more effective and cost-efficient care, improve the trajectory for those living with and at risk of heart failure, and ensure healthier, more active, and more fulfilling lives as we all age.

Endnotes

1. World Health Organization. "About Cardiovascular Diseases". Accessed January 2020. Available at: https://www.who.int/cardiovascular_diseases/about_cvd/en/
2. Shimokawa, Hiroaki, Masanobu Miura, Kotaro Nochioka, & Yasuhiko Sakata. "Heart Failure as a General Pandemic in Asia." July 2015. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/ehf.319>
3. Gallino, Augusto. "Swiss National Strategy for 2017–2024." November 2017. Available at: <https://academic.oup.com/eurheartj/article/38/42/3117/4600166>
4. Gallino, Augusto. "Swiss National Strategy for 2017–2024." November 2017. Available at: <https://academic.oup.com/eurheartj/article/38/42/3117/4600166>
5. Velagaleti, Raghava S & Ramachandran S Vasan. "Heart Failure in the Twenty-first Century: Is It a Coronary Artery Disease or Hypertension Problem?" November 2007. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2350191/>
6. Taylor, Clare J, José M Ordóñez-Mena, Andrea K Roalfe, Sarah Lay-Flurrie, Nicholas R Jones, Tom Marshall, and Richard Hobbs. "Trends in Survival after a Diagnosis of Heart Failure in the United Kingdom 2000–2017: Population Based Cohort Study." February 2019. Available at: <https://www.bmj.com/content/364/bmj.l223>
7. Taylor, Clare J, José M Ordóñez-Mena, Andrea K Roalfe, Sarah Lay-Flurrie, Nicholas R Jones, Tom Marshall, and Richard Hobbs. "Trends in Survival after a Diagnosis of Heart Failure in the United Kingdom 2000–2017: Population Based Cohort Study." February 2019. Available at: <https://www.bmj.com/content/364/bmj.l223>
8. Kell, Emily, Suzanne Wait, Ed Harding, and Iseult McLister. "A Policy Brief on Heart Failure in Europe." March 2015. Available at: <http://www.healthpolicypartnership.com/wp-content/uploads/HFPN-Policy-Backgrounder-March2015-FINAL-EXTERNAL1.pdf>
9. Savarese, Gianluigi & Lars H. Lund. "Global Public Health Burden of Heart Failure." April 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5494150>
10. Savarese, Gianluigi & Lars H. Lund. "Global Public Health Burden of Heart Failure." April 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5494150>
11. World Heart Federation. "World Heart Federation Roadmap for Heart Failure." September 2019. Available at: <https://www.world-heart-federation.org/cvd-roadmaps/wp-content/uploads/sites/6/2019/09/WHF-Heart-Failure-Roadmap-WEB.pdf>
12. American Heart, Association. "What Is Heart Failure?" May 2017. Available at: <https://www.heart.org/en/health-topics/heart-failure/what-is-heart-failure>
13. Cleveland, Clinic. "Understanding Heart Failure." May 2019. Available at: <https://my.clevelandclinic.org/health/diseases/17069-heart-failure-understanding-heart-failure>
14. American Heart, Association. "Causes of Heart Failure." May 2017. Available at: <https://www.heart.org/en/health-topics/heart-failure/causes-and-risks-for-heart-failure/causes-of-heart-failure>
15. Harvard Health Publishing. "Heart Failure in Women." September 2008. Available at: https://www.health.harvard.edu/newsletter_article/Heart_failure_in_women
16. American Heart Association. "Warning Signs of Heart Failure." May 2017. Available at: <https://www.heart.org/en/health-topics/heart-failure/warning-signs-of-heart-failure>
17. Friedman, Maureen M. "Older Adults' Symptoms and Their Duration before Hospitalization for Heart Failure." June 2004. Available at: <https://www.sciencedirect.com/science/article/pii/S0147956397900534>
18. Jurgens, Corrine Y. "Why Do Elders Delay Responding to Heart Failure Symptoms?" August 2009. Available at: https://journals.lww.com/nursingresearchonline/Abstract/2009/07000/Why_Do_Elders_Delay_Responding_to_Heart_Failure.7.aspx
19. Bekelman, David B., Edward P. Havranek, Diane M. Becker, Jean S. Kutner, Pamela N. Peterson, Ilan S. Wittstein, Sheldon H. Gottlieb, Traci E. Yamashita, Diane L. Fairclough, and Sydney M. Dy. "Symptoms, Depression, and Quality of Life in Patients With Heart Failure." October 2007. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S1071916407001674>
20. Kilgore, Meredith, Harshali K Patel, Adrian Kielhorn, Juan F Maya, and Pradeep Sharma. "Economic Burden of Hospitalizations of Medicare Beneficiaries with Heart Failure". May 2017. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/28546776>
21. Savarese, Gianluigi & Lars H. Lund. "Global Public Health Burden of Heart Failure." April 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5494150>
22. Heart Failure Policy Network. "National Heart Failure Strategies with Measurable Goals." 2018. Available at: <http://www.hfpolicynetwork.eu/hftoolkit/make-hf-a-national-priority/national-hf-strategies-with-measurable-goals/>
23. Cowie, Martin R. "The Heart Failure Epidemic: A UK Perspective." March 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5435875/>

24. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
25. The Heart Failure Policy Network. "The clinical management of heart failure: What is the state of play in Europe?" 2017. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/HFPN_SOP_Clinical_management.pdf
26. Gallino, Augusto. "Swiss National Strategy for 2017–2024." November 2017. Available at: <https://academic.oup.com/eurheartj/article/38/42/3117/4600166>
27. Ambrosy, Andrew P., Gregg C. Fonarow, Javed Butler, Ovidiu Chioncel, Stephen J. Greene, Muthiah Vaduganathan, Savina Nodari, Carolyn S.P. Lam, Naoki Sato, Ami N. Shah, and Mihai Gheorghiade. "The Global Health and Economic Burden of Hospitalizations for Heart Failure: Lessons Learned from Hospitalized Heart Failure Registries." February 2014. Available at: <https://www.sciencedirect.com/science/article/pii/S0735109714002915?via%3Dihub>
28. Bui, Anh L, Tamara B Horwich, % Gregg C Fonarow. "Epidemiology and Risk Profile of Heart Failure." January 2011. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3033496/>
29. Cleveland, John, Dirk Van Veldhuisen, & Piotr Ponikowski. "Year in Cardiology 2018: Heart Failure." February 2019. Available at: <https://academic.oup.com/eurheartj/article/40/8/651/5333120>
30. Ambrosy, Andrew P., Gregg C. Fonarow, Javed Butler, Ovidiu Chioncel, Stephen J. Greene, Muthiah Vaduganathan, Savina Nodari, Carolyn S.P. Lam, Naoki Sato, Ami N. Shah, and Mihai Gheorghiade. "The Global Health and Economic Burden of Hospitalizations for Heart Failure: Lessons Learned from Hospitalized Heart Failure Registries." February 2014. Available at: <https://www.sciencedirect.com/science/article/pii/S0735109714002915?via%3Dihub>
31. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
32. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
33. The National Collaborating Centre for Chronic Conditions. "Chronic Heart Failure: National Clinical Guidelines for Diagnosis and Management in Primary and Secondary Care." 2003. Available at: <https://pubmed.ncbi.nlm.nih.gov/22741186/>
34. Massimo Imazio, Antonino Maria Cotroneo, Gianni Gaschino, Alessandra Chinaglia, Pietro Gareri, Roberto Lacava, Tommaso Diego Voci, & Rita Trincherio. "Management of Heart Failure in Elderly People". 2008. Available at: <https://www.medscape.org/viewarticle/572579>
35. Samala, Renato V., Viviana Navas, Emily Saluke, & Jerry Ciocon. "Heart Failure in Frail, Older Patients: We Can Do 'MORE'." December 2011. Available at: https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/issues/articles/media_eeb139b_837.pdf
36. Samala, Renato V., Viviana Navas, Emily Saluke, & Jerry Ciocon. "Heart Failure in Frail, Older Patients: We Can Do 'MORE'." December 2011. Available at: https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/issues/articles/media_eeb139b_837.pdf
37. Grüner Sveälv, Bente, Gunilla Fritzon, & Burt Andersson. "Gender and Age Related Differences in Left Ventricular Function and Geometry with Focus on the Long Axis." August 2006. Available at: <https://academic.oup.com/ehjcmimaging/article/7/4/298/2367140>
38. European Society of Cardiology. "Nearly Half of Public Wrongly Believe Heart Failure Is Normal in Old Age." May 2019. Available at: <https://www.escardio.org/The-ESC/Press-Office/Press-releases/nearly-half-of-public-wrongly-believe-heart-failure-is-normal-in-old-age>
39. Brambatti, M., A. Capucci, & M. V. Matassini. "Current Therapeutic Options for Heart Failure in Elderly Patients." November 2017. Available at: <https://www.hindawi.com/journals/bmri/2017/1483873/>
40. American Heart Association. "Common Tests for Heart Failure." May 2017. Available at: <https://www.heart.org/en/health-topics/heart-failure/diagnosing-heart-failure/common-tests-for-heart-failure>
41. Massimo Imazio, Antonino Maria Cotroneo, Gianni Gaschino, Alessandra Chinaglia, Pietro Gareri, Roberto Lacava, Tommaso Diego Voci, & Rita Trincherio. "Management of Heart Failure in Elderly People". 2008. Available at: <https://www.medscape.org/viewarticle/572579>
42. Savarese, Gianluigi & Lars H. Lund. "Global Public Health Burden of Heart Failure." April 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5494150>
43. Von Lueder, Thomas G, and Stefan Agewall. "The Burden of Heart Failure in the General Population: A Clearer and More concerning Picture." June 2018. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6036024/>

44. The National Collaborating Centre for Chronic Conditions. "CHRONIC HEART FAILURE: National Clinical Guideline for Diagnosis and Management in Primary and Secondary Care." 2003. Available at: <https://www.nice.org.uk/guidance/cg108/documents/chronic-heart-failure-partial-update-prepublication-check-appendix-m2>
45. Taylor, Clare J, José M Ordóñez-Mena, Andrea K Roalfe, Sarah Lay-Flurrie, Nicholas R Jones, Tom Marshall, & Richard Hobbs. "Trends in Survival after a Diagnosis of Heart Failure in the United Kingdom 2000-2017: Population Based Cohort Study." February 2019. Available at: <https://www.bmj.com/content/364/bmj.i223>
46. Ding, Qinglan, Karen S. Yehle, Nancy E. Edwards, & Rosanne R. Griggs. "Geriatric Heart Failure: Awareness, Evaluation, and Treatment in Primary Care." December 2013. Available at: [https://www.npjjournal.org/article/S1555-4155\(13\)00403-0/pdf](https://www.npjjournal.org/article/S1555-4155(13)00403-0/pdf)
47. Samala, Renato V., Viviana Navas, Emily Saluke, & Jerry Ciocon. "Heart Failure in Frail, Older Patients: We Can Do 'MORE'." December 2011. Available at: https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/issues/articles/media-eeb139b_837.pdf
48. Massimo Imazio, Antonino Maria Cotroneo, Gianni Gaschino, Alessandra Chinaglia, Pietro Gareri, Roberto Lacava, Tommaso Diego Voci, & Rita Trincherio. "Management of Heart Failure in Elderly People." 2008. Available at: <https://www.medscape.org/viewarticle/572579>
49. Brambatti, M., A. Capucci, & M. V. Matassini. "Current Therapeutic Options for Heart Failure in Elderly Patients." November 2017. Available at: <https://www.hindawi.com/journals/bmri/2017/1483873/>
50. American Heart Association. "Common Tests for Heart Failure." May 2017. Available at: <https://www.heart.org/en/health-topics/heart-failure/diagnosing-heart-failure/common-tests-for-heart-failure>
51. Heart Failure Policy Network. "National Heart Failure Strategies with Measurable Goals." 2018. Available at: <http://www.hfpolicynetwork.eu/hftoolkit/make-hf-a-national-priority/national-hf-strategies-with-measurable-goals/>
52. Gaborit, Freja Stoltze, Caroline Kistorp, Thomas Kümler, Christian Hassager, Niels Tønder, Lars Køber, Pernille Mørk Hansen, Pia Rørbaek Kamstrup, Jens Faber, Kasper Karmark Iversen, & Morten Schou. "Prevalence of Early Stages of Heart Failure in an Elderly Risk Population: The Copenhagen Heart Failure Risk Study." Open Heart. February 2019. Available at: <https://openheart.bmj.com/content/6/1/e000840.abstract>
53. Gallagher, Joseph, Stephanie James, Ciara Keane, Annie Fitzgerald, Bronagh Travers, Etain Quigley, Christina Hecht, Shuaiwei Zhou, Chris Watson, Mark Ledwidge, & Kenneth McDonald. "Heart Failure Virtual Consultation: Bridging the Gap of Heart Failure Care in the Community - A Mixed-methods Evaluation." August 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5542774/>
54. Safstrom, Emma, Tiny Jaarsma, & Anna Strömberg. "Continuity and Utilization of Health and Community Care in Elderly Patients with Heart Failure before and after Hospitalization." 2018. Available at: <https://bmccgeriatr.biomedcentral.com/articles/10.1186/s12877-018-0861-9#auth-1>
55. Safstrom, Emma, Tiny Jaarsma, & Anna Strömberg. "Continuity and Utilization of Health and Community Care in Elderly Patients with Heart Failure before and after Hospitalization." 2018. Available at: <https://bmccgeriatr.biomedcentral.com/articles/10.1186/s12877-018-0861-9#auth-1>
56. Safstrom, Emma, Tiny Jaarsma, & Anna Strömberg. "Continuity and Utilization of Health and Community Care in Elderly Patients with Heart Failure before and after Hospitalization." 2018. Available at: <https://bmccgeriatr.biomedcentral.com/articles/10.1186/s12877-018-0861-9#auth-1>
57. Shanbhag, Deepti, Ian D. Graham, Karen Harlos, Brian Haynes, Itzhak Gabizon, Stuart J. Connolly, & Harriette Gillian Christine Van Spall. "Effectiveness of Implementation Interventions in Improving Physician Adherence to Guideline Recommendations in Heart Failure: A Systematic Review." 2017. Available at: <https://bmjopen.bmj.com/content/8/3/e017765>
58. The National Collaborating Centre for Chronic Conditions. "Chronic Heart Failure: National Clinical Guidelines for Diagnosis and Management in Primary and Secondary Care." 2003. Available at: <https://pubmed.ncbi.nlm.nih.gov/22741186/>
59. Savarese, Gianluigi & Lars H. Lund. "Global Public Health Burden of Heart Failure." April 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5494150>
60. Gustafsson, Finn, & John Malcolm O. Arnold. "Heart Failure Clinics and Outpatient Management: Review of the Evidence and Call for Quality Assurance." September 2004. Available at: <https://academic.oup.com/eurheartj/article/25/18/1596/400143>
61. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
62. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
63. World Heart Federation. "World Heart Federation Roadmap for Heart Failure." September 2019. Available at: <https://www.world-heart-federation.org/cvd-roadmaps/wp-content/uploads/sites/6/2019/09/WHF-Heart-Failure-Roadmap-WEB.pdf>

64. Gallagher, Joe, Chris Watson, Patricia Campbell, Mark Ledwidge, & Kenneth McDonald. "Natriuretic Peptide-based Screening and Prevention of Heart Failure." November 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5789219/>
65. Huelsmann, Martin, Stephanie Neuhold, Michael Resl, Guido Strunk, Helmut Brath, Claudia Francesconi, Christopher Adlbrecht, Rudolf Prager, Anton Luger, Richard Pacher, & Martin Clodi. "PONTIAC (NT-proBNP Selected PreventiOn of Cardiac EveNts in a PopulaTion of Dlabetic Patients without A History of Cardiac Disease): A Prospective Randomized Controlled Trial." June 2013. Available at: <https://www.sciencedirect.com/science/article/pii/S0735109713025175>
66. Samala, Renato V., Viviana Navas, Emily Saluke, & Jerry Ciocon. "Heart Failure in Frail, Older Patients: We Can Do 'MORE'." December 2011. Available at: https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/issues/articles/media-eeb139b_837.pdf
67. Samala, Renato V., Viviana Navas, Emily Saluke, & Jerry Ciocon. "Heart Failure in Frail, Older Patients: We Can Do 'MORE'." December 2011. Available at: https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/issues/articles/media-eeb139b_837.pdf
68. Wang, Yajuan, Kenney Ng, Roy J Byrd, Jianying Hu, Shahram Ebadollahi, Zahra Daar, Christopher DeFilippi, Steven R Steinhubl, & Walter F Stewart. "Early Detection of Heart Failure with Varying Prediction Windows by Structured and Unstructured Data in Electronic Health Records." 2015. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5233460/>
69. Health Policy Partnership. Heart Failure (HF) country barometer: Ireland. https://globalhearhub.org/wp-content/uploads/2019/05/HF_Barometer-Irish.pdf
70. HeartBeat Trust. "Welcome to HeartBeat Trust." Accessed September 2020. Available at: <https://www.heartbeattrust.ie/>
71. Ledwidge, Mark, Gallagher, Joseph, Conlon, Carmel, Tallon, Elaine, O'Connell, Eoin, Dawkins, Ian, Watson, Chris, O'Hanlon, Rory, Bermingham, Margaret, Patle, Anil, R Badabhagani, Mallikarjuna, Murtagh, Gillian, Voon, Victor, Tilson, Leslie, Barry, Michael, McDonald, Laura, Maurer, Brian, & McDonald, Kenneth. "Natriuretic Peptide-Based Screening and Collaborative Care for Heart Failure The STOP-HF Randomized Trial." July 2013. Available at: <https://jamanetwork.com/journals/jama/fullarticle/1707723>
72. Ledwidge, Mark T, O'Connell, Eoin, Gallagher, Joseph, Tilson, Lesley, James, Stephanie, Voon, Victor, Bermingham, Margaret, Tallon, Elaine, Watson, Chris, O'Hanlon, Rory, Barry, Michael, & McDonald, Kenneth. "Cost-effectiveness of natriuretic peptide-based screening and collaborative care: a report from the STOP-HF (St Vincent's Screening TO Prevent Heart Failure) study." July 2015. Available at: <https://pubmed.ncbi.nlm.nih.gov/26139583/>
73. Heart Failure Policy Network. "Pressure Point 4: Patient Empowerment and Self-care." 2018. Available at: https://www.hfpolicynetwork.org/wp-content/uploads/2018/10/HF_PP4_patient_empowerment_and_self_care.pdf
74. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
75. Ding, Qinglan, Karen S. Yehle, Nancy E. Edwards, & Rosanne R. Griggs. "Geriatric Heart Failure: Awareness, Evaluation, and Treatment in Primary Care." December 2013. Available at: [https://www.npjjournal.org/article/S1555-4155\(13\)00403-0/pdf](https://www.npjjournal.org/article/S1555-4155(13)00403-0/pdf)
76. Glavas, Duska. "Heart Failure Awareness Days 2018." 2018. Available at: https://www.escardio.org/static_file/Escardio/Subspecialty/HFA/Advocacy%20and%20Awareness/Awareness%20day/Documents/HFAD%202018/Croatia%20Awareness%20Days%202018.pdf
77. Vinson, J M, M W Rich, J C Sperry, A S Shah, & T. Mc-Namara. "Early Readmission of Elderly Patients with Congestive Heart Failure." December 1990. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/2254567?dopt=Abstract>
78. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
79. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
80. Friedman, Maureen M. "Older Adults' Symptoms and Their Duration before Hospitalization for Heart Failure." June 2004. Available at: <https://www.sciencedirect.com/science/article/pii/S0147956397900534>
81. Harvard Health Publishing. "Heart Failure in Women." September 2008. Available at: https://www.health.harvard.edu/newsletter_article/Heart_failure_in_women
82. Samala, Renato V., Viviana Navas, Emily Saluke, & Jerry Ciocon. "Heart Failure in Frail, Older Patients: We Can Do 'MORE'." December 2011. Available at: https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/issues/articles/media-eeb139b_837.pdf
83. Ding, Qinglan, Karen S. Yehle, Nancy E. Edwards, & Rosanne R. Griggs. "Geriatric Heart Failure: Awareness, Evaluation, and Treatment in Primary Care." December 2013. Available at: [https://www.npjjournal.org/article/S1555-4155\(13\)00403-0/pdf](https://www.npjjournal.org/article/S1555-4155(13)00403-0/pdf)

84. Ding, Qinglan, Karen S. Yehle, Nancy E. Edwards, & Rosanne R. Griggs. "Geriatric Heart Failure: Awareness, Evaluation, and Treatment in Primary Care." December 2013. Available at: [https://www.npjjournal.org/article/S1555-4155\(13\)00403-0/pdf](https://www.npjjournal.org/article/S1555-4155(13)00403-0/pdf)
85. American Hospital Association. "Dignity Health St. John's Hospitals - Heart Failure Program." Accessed September 2020. Available at: <https://www.aha.org/case-studies/2016-08-26-dignity-health-st-johns-hospitals-heart-failure-program>
86. American Hospital Association. "Improvement in the Management of Congestive Heart Failure Population." Accessed September 2020. Available at: <https://www.aha.org/case-studies/2015-05-28-improvement-management-congestive-heart-failure-population>
87. U.S. News & World Report. "Best Hospitals. 2016 Edition." Available at: https://www.heart.org/idc/groups/heart-public/wcm/@gwtg/documents/downloadable/ucm_476918.pdf
88. Dignity Health. St. John's Regional Medical Center. "Community Benefit 2015 Report and 2016 Plan." 2015. Available at: <https://www.dignityhealth.org/cm/media/documents/St-Johns-Regional-Medical-Center.pdf>
89. Heart Failure Policy Network. "The Handbook of Multidisciplinary and Integrated Heart Failure Care." September 2018. Available at: https://www.hfpolicynetwork.org/wp-content/uploads/2018/09/HFPN_handbookD_DIGITAL.pdf
90. Ponikowski, Piotr, et al. "2016 ESC Guidelines for the Diagnosis and Treatment of Acute and Chronic Heart Failure: The Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure of the European Society of Cardiology (ESC) Developed with the Special Contribution of the Heart Failure Association (HFA) of the ESC." July 2016. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/27206819>
91. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
92. Cowie, Martin R. "The Heart Failure Epidemic: A UK Perspective." March 2017. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5435875/>
93. Shanbhag, Deepti, Ian D. Graham, Karen Harlos, Brian Haynes, Itzhak Gabizon, Stuart J. Connolly, & Harriette Gillian Christine Van Spall. "Effectiveness of Implementation Interventions in Improving Physician Adherence to Guideline Recommendations in Heart Failure: A Systematic Review." 2017. Available at: <https://bmjopen.bmj.com/content/8/3/e017765>
94. Shanbhag, Deepti, Ian D. Graham, Karen Harlos, Brian Haynes, Itzhak Gabizon, Stuart J. Connolly, & Harriette Gillian Christine Van Spall. "Effectiveness of Implementation Interventions in Improving Physician Adherence to Guideline Recommendations in Heart Failure: A Systematic Review." 2017. Available at: <https://bmjopen.bmj.com/content/8/3/e017765>
95. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
96. The Heart Failure Policy Network. "The Heart Failure Policy Toolkit." September 2015. Available at: https://www.healthpolicypartnership.com/wp-content/uploads/hfpn/HF_Policy_Toolkit_Sept_2015.pdf
97. Riley, Jillian. "The Key Roles for the Nurse in Acute Heart Failure Management." October 2015. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5490951/>
98. Riley, Jillian. "The Key Roles for the Nurse in Acute Heart Failure Management." August 2015. Available at: <https://www.cfrjournal.com/articles/nurse-acute-heart-failure-management>
99. Gustafsson, Finn, & John Malcolm O. Arnold. "Heart Failure Clinics and Outpatient Management: Review of the Evidence and Call for Quality Assurance." September 2004. Available at: <https://academic.oup.com/eurheartj/article/25/18/1596/400143>
100. Hauptman, Paul J., et al. "The Heart Failure Clinic: A Consensus Statement of the Heart Failure Society of America." December 2008. Available at: [https://www.onlinejcf.com/article/S1071-9164\(08\)01012-9/fulltext](https://www.onlinejcf.com/article/S1071-9164(08)01012-9/fulltext)
101. Strömberg, Anna. "Heart Failure Clinics." November 1998. Available at: <https://heart.bmj.com/content/80/5/426#ref-6>
102. Hauptman, Paul J., et al. "The Heart Failure Clinic: A Consensus Statement of the Heart Failure Society of America." December 2008. Available at: [https://www.onlinejcf.com/article/S1071-9164\(08\)01012-9/fulltext](https://www.onlinejcf.com/article/S1071-9164(08)01012-9/fulltext)
103. Feltner, Cynthia, Christine D Jones, Crystal W Cené, Zhi-Jie Zheng, Carla A Sueta, Emmanuel J L Coker-Schwimmer, Marina Arvanitis, Kathleen N Lohr, Jennifer C Middleton, and Daniel E Jonas. "Transitional Care Interventions to Prevent Readmissions for Persons with Heart Failure: A Systematic Review and Meta-analysis." June 2014. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/24862840>
104. Feltner, Cynthia, Christine D Jones, Crystal W Cené, Zhi-Jie Zheng, Carla A Sueta, Emmanuel J L Coker-Schwimmer, Marina Arvanitis, Kathleen N Lohr, Jennifer C Middleton, and Daniel E Jonas. "Transitional Care Interventions to Prevent Readmissions for Persons with Heart Failure: A Systematic Review and Meta-analysis." June 2014. Available at: <https://www.ncbi.nlm.nih.gov/pubmed/24862840>

105. Heart Failure Policy Network. "The handbook of multi-disciplinary and integrated heart failure care. Case studies." Accessed September 2020. Available at: <https://www.hfpolicy-network.org/handbook/case-studies-tools/>
106. Heart Failure Policy Network. "The Handbook of Multidisciplinary and Integrated Heart Failure Care." September 2018. Available at: https://www.hfpolicy-network.org/wp-content/uploads/2018/09/HFPN_handbookD_DIGITAL.pdf
107. Comín-Coleta, Josep, Verdú-Rotellar, José María, Velaz Emili, Clèriesg Montse, Bustinsg, Montserrat, Mendozab, Lola, Badosaa, Neus, Cladellasc, Mercè, Ferréb, Sofia, & Bruguera, Jordi. "Efficacy of an Integrated Hospital-primary Care Program for Heart Failure: A Population-based Analysis of 56 742 Patients." Available at: <https://www.revespcardiol.org/en-efficacy-an-integrated-hospital-primary-care-articulo-S1885585714000267>
108. Comín-Coleta, Josep, Verdú-Rotellar, José María, Velaz Emili, Clèriesg Montse, Bustinsg, Montserrat, Mendozab, Lola, Badosaa, Neus, Cladellasc, Mercè, Ferréb, Sofia, & Bruguera, Jordi. "Efficacy of an Integrated Hospital-primary Care Program for Heart Failure: A Population-based Analysis of 56 742 Patients." Available at: <https://www.revespcardiol.org/en-efficacy-an-integrated-hospital-primary-care-articulo-S1885585714000267>
109. Comín-Coleta, Josep, Enjuanes, Cristina, Verdú-Rotellar, José M, Anna Linas, Ruiz-Rodríguez, Pilar, González-Robledo, Pilar, Farré, Núria, Moliner-Borja, Pedro, Ruiz-Bustillo, Sonia, & Bruguera, Jordi. "Impact on clinical events and healthcare costs of adding telemedicine to multidisciplinary disease management programmes for heart failure: Results of a randomized controlled trial." September 2015. Available at: https://journals.sagepub.com/doi/abs/10.1177/1357633X15600583?rfr_dat=cr_pub%3Dpubmed&url_ver=Z39.88&
110. Souza, Emiliane Nogueira De, Luis Eduardo Rohde, Karen Brasil Ruschel, Cláudia Mota Mussi, Luis Beck-da-Silva, Andréia Biolo, Nadine Clausell, and Eneida Rejane Rabelo-Silva. "A Nurse-based Strategy Reduces Heart Failure Morbidity in Patients Admitted for Acute Decompensated Heart Failure in Brazil: The HELEN-II Clinical Trial." July 2014. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/ehf.125>
111. Souza, Emiliane Nogueira De, Luis Eduardo Rohde, Karen Brasil Ruschel, Cláudia Mota Mussi, Luis Beck-da-Silva, Andréia Biolo, Nadine Clausell, and Eneida Rejane Rabelo-Silva. "A Nurse-based Strategy Reduces Heart Failure Morbidity in Patients Admitted for Acute Decompensated Heart Failure in Brazil: The HELEN-II Clinical Trial." July 2014. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1002/ehf.125>
112. Andrés, Emmanuel, Samy Talha, Abrar-Ahmad Zulfiqar, Mohamed Hajjam, Sylvie Ervé, Jawad Hajjam, Bernard Gény, and Amir Hajjam El Hassani. "Current Research and New Perspectives of Telemedicine in Chronic Heart Failure: Narrative Review and Points of Interest for the Clinician." December 2018. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6306809/>
113. Andrés, Emmanuel, Samy Talha, Abrar-Ahmad Zulfiqar, Mohamed Hajjam, Sylvie Ervé, Jawad Hajjam, Bernard Gény, and Amir Hajjam El Hassani. "Current Research and New Perspectives of Telemedicine in Chronic Heart Failure: Narrative Review and Points of Interest for the Clinician." December 2018. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6306809/>
114. Koehler, Friedrich, Kerstin Koehler, Oliver Deckwart, Sandra Prescher, Karl Wegscheider, and Bridget-Anne Kirwan, et al. "Efficacy of Telemedical Interventional Management in Patients with Heart Failure (TIM-HF2): A Randomised, Controlled, Parallel-group, Unmasked Trial." September 2018. Available at: [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(18\)31880-4/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)31880-4/fulltext)
115. mecor. "What is mecor?" Accessed September 2020. Available at: <https://www.hcsg.de/program/#/program>
116. "The Heart Failure Policy Network. "The Handbook of Multidisciplinary and Integrated Heart Failure Care," September 2018. Available at: <https://orqadesign-development.com/case-study/mecor-software/>
117. Stegmaier, P.: „Leiter: Nun sollten die Kassen die Chance ergreifen“, Monitor Versorgungsforschung (04/20), S. 18-21; doi: 10.24945/MVF.04.20.1866-0533.2232
118. The National Collaborating Centre for Chronic Conditions. "Chronic Heart Failure: National Clinical Guidelines for Diagnosis and Management in Primary and Secondary Care." 2003. Available at: <https://pubmed.ncbi.nlm.nih.gov/22741186/>
119. Kell, Emily, Suzanne Wait, Ed Harding, and Iseult McLister. "A Policy Brief on Heart Failure in Europe." March 2015. Available at: <http://www.healthpolicypartnership.com/wp-content/uploads/HFPN-Policy-Backgrounder-March2015-FINAL-EXTERNAL1.pdf>
120. Ezekowitz, Justin A., et al. "8. Community Management of Heart Failure." 2017. Available at: <http://www.ccs.ca/eguidelines/Content/Topics/HeartFailure/8%20Community%20Management%20of%20Heart%20Failure.htm>
121. Ezekowitz, Justin A., et al. "8. Community Management of Heart Failure." 2017. Available at: <http://www.ccs.ca/eguidelines/Content/Topics/HeartFailure/8%20Community%20Management%20of%20Heart%20Failure.htm>
122. Chaudhry, Sarwat I, Gail McAvay, Shu Chen, Heather Whitson, Anne B Newman, Harlan M Krumholz, and Thomas M Gill. "Risk Factors for Hospital Admission among Older Persons with Newly Diagnosed Heart Failure: Findings from the Cardiovascular Health Study." February 2013. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3576871/>



About the Global Alliance on Heart Failure & Healthy Aging

The Global Alliance on Heart Failure and Healthy Aging was borne out of a series of roundtables in the United States and Europe throughout 2018. These discussions brought together more than 70 experts from diverse geographies, disciplines, and areas of expertise to reframe heart failure as an urgent priority in the context of population aging and to call for more attention and action to support early detection, diagnosis, and treatment of heart failure, particularly among older adults. Click [here](#) to learn more about the Alliance partners and read the Alliance's Consensus Statement and Call to Action.

About the Global Coalition on Aging

The Global Coalition on Aging aims to reshape how global leaders approach and prepare for the 21st century's profound shift in population aging. GCOA uniquely brings together global corporations across industry sectors with common strategic interests in aging populations, a comprehensive and systemic understanding of aging, and an optimistic view of its impact. Through research, public policy analysis, advocacy, and strategic communications, GCOA is advancing innovative solutions and working to ensure global aging is a path to health, productivity and economic growth. For more information, visit www.global-coalitiononaging.com.

For more information contact

Melissa Gong Mitchell
mmitchell@globalcoalitiononaging.com