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A SHORT ASSESSMENT ON " CONGESTIVE HEART FAILURE " : REVIEW ARTICLE

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ABSTRACT

Heart failure is a life-threatening illness and its management should be seen as a global health priority. Currently, about 26 million people around the world live with heart failure. The outlook for these patients is poor and they have a lower survival rate than colon, breast, or prostate cancer. Heart failure also puts a heavy burden on patients, caregivers and the healthcare system. Demand for medical services is expected to grow exponentially over the next 10 years, especially as the number of patients increases due to the aging of the population and changes in lifestyle. Improved survival rate.

For people with heart failure, it develops as the end of another illness. It is time to take a clear political initiative to prioritize the prevention of heart failure and ensure fair care for all without burdening the healthcare system. Aging is associated with many changes in body composition and organ function, resulting in major changes in the absorption, distribution, metabolism, and excretion of virtually all drugs. In addition, older patients with heart failure (HF) most often have multiple comorbidities that require medication.

This article describes common side effects and drug interactions associated with the management of heart failure in older patients and outlines strategies for reducing the risk of side effects. To minimize these risks, clinicians should avoid prescribing unwanted medications or adjusting drug dosages to balance benefits and side effects. Medicines are clinically significant adverse events and lifestyles. It is important to note that it can affect quality and actually occurs.

When treating older patients with heart failure, the often quoted "start low and slow" maxim clearly applies. Despite the inherent challenges, careful management and close follow-up can help most elderly patients with heart failure successfully cope with the wise use of heart failure treatments recommended by the guidelines.

Keywords: Management, Health Priority, Survival Rate, Comorbities.

INTRODUCTION

Heart failure is a complex clinical syndrome resulting from functional or structural heart failure that impairs ventricular filling or blood drainage into the systemic circulation. By definition, it cannot meet the system requirements of the circuit. Heart failure remains a prevalent disease worldwide, with high morbidity and mortality. It has an estimated prevalence of 26 million people worldwide and is contributing to the increase in medical costs around the world. [1] Several different illnesses can cause heart failure. The etiology of heart failure changes the treatment plan to some extent. However, most recommended treatments are based solely on the presence of heart failure, regardless of cause. Heart failure occurs when the heart muscle does not pump blood normally. Blood often collects, and water accumulates in the lungs (congestion) and legs. Accumulation of water can cause shortness of breath and swelling of the legs and feet. Poor circulation can cause the skin to appear blue (cyanotic).

Heart failure is caused by many conditions that damage the heart muscle.

- Coronary heart disease. Coronary artery disease (CAD), a disease of the arteries that supply the heart with blood and oxygen, causes a decrease in blood flow to the heart muscle. When an artery is blocked or severely narrowed, the heart suffers from a lack of oxygen and nutrients.
- Heart attack. A heart attack occurs when the coronary arteries suddenly occlude and blood flow to the heart muscle stops. A heart attack damages the heart muscle and causes the damaged area to malfunction.
- Cardiomyopathy. Myocardial damage due to causes other than arterial and blood flow problems B. Due to infection or alcohol or substance abuse. A condition that overloads the heart. Conditions such as high blood pressure, valve disease, thyroid disease, kidney disease, diabetes, or heart defects that are present at birth can all cause heart failure. In addition, heart failure can occur when multiple illnesses or conditions are present at the same time.
- Although Heart Failure is progressive, current therapy may provide stability and even reversibility. The inexorable progression of Heart Failure from Left Ventricle remodeling and dysfunction is no longer inevitable. Prolonged survival with mild to moderate Left Ventricle dysfunction is now possible. Therapy with angiotensinconverting enzyme inhibitors (or angiotensin receptor blockers), beta blockers, and cardiac resynchronization therapy can lead to slowing or to partial reversal of remodeling.

- Heart failure can severely decrease the functional capacity of a patient and increase mortality risk. It is imperative to diagnose and effectively treat the disease to prevent recurrent hospitalizations, improve quality of life, and enhance patient outcomes.

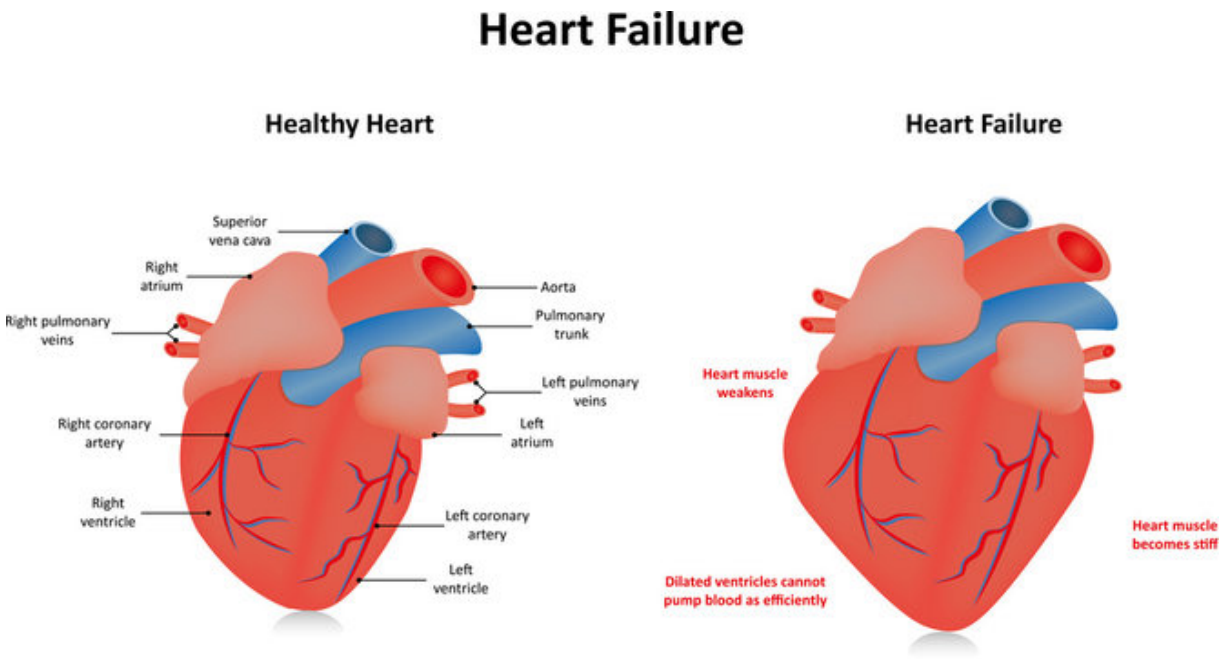
- Definition

Heart failure is a syndrome commonly caused by cardiac dysfunction caused by myocardial dysfunction. Or loss, LV expansion or Hypertrophy or both. Whether the dysfunction is predominantly systolic, diastolic, or mixed, it usually results in neurohormonal and cardiovascular abnormalities. Causes characteristic symptoms such as water Retention, shortness of breath, fatigue, especially With exertion. If there is no suitable treatment Intervention, HF is usually at a progressive level Both cardiac function and clinical symptoms. Or The severity of clinical symptoms can vary significantly In the process of illness, probably not Correlates with changes in underlying cardiac function. Heart failure is progressive and often fatal, Patients are stable and may develop myocardial dysfunction And remodeling voluntarily or As a result of treatment. Physiologically, HF A syndrome characterized by venous congestion in the lungs and / or systemic and / or inadequate peripheral oxygenation at rest or during illness. Stress caused by cardiac dysfunction.

Types of Heart Failure

Systolic heart failure: occurs when the heart muscle is not compressed with sufficient force. When doing so, it pumps less oxygenated blood through your body.

Diastolic heart failure: the heart is pushed out normally, but the ventricles (main pump chambers) do not relax properly. Less blood reaches the heart and blood pressure in the lungs rises. When that happens, the lungs, legs, and abdomen get hydrated.



Level A

This is the time when you are more likely to develop heart failure. You may be in this phase if:

- High blood pressure
- Diabetes Coronary heart disease
- Metabolic syndrome.
- If you have the following history,

Your chances are great.

Cardiotoxic drug therapy

Alcohol abuse

Rheumatic fever

Family with cardiomyopathy.

Your doctor will advise you to exercise regularly and stop drinking, smoking and using illegal drugs.

Measures should be taken to reduce high blood pressure and high cholesterol.

If you have high blood pressure or a heart attack, your doctor may prescribe beta-blockers.

If you have other heart or vascular conditions such as diabetes, high blood pressure, or coronary artery disease, you should take an ACE inhibitor or angiotensin II receptor blocker (ARB).

Level B

You have never had any symptoms of heart failure, but you are at this stage when you are diagnosed with contractile dysfunction in the left ventricle. This means that the left ventricle of the heart is not pumped well. You can belong to this group if:

- Heart attack
- Valvular disease
- Cardiomyopathy.

Treatment depends on the situation.

After a heart attack, your doctor may suggest an ACE inhibitor or angiotensin II receptor blocker (ARB) or beta blocker. If symptoms persist while taking beta-blockers and ACE / ARB medications, you can add aldosterone inhibitors. Surgery can repair coronary arteries and valves, or valves that need to be replaced. Implantable cardioverter-defibrillators (ICDs) may help.

Level C

If you have systolic heart failure with the following symptoms, you are at this stage.

- Dyspnea Malaise
- Low practice ability.

Your doctor may prescribe the following for you:

- ACE inhibitors and
- Beta blockers

Angiotensin receptor blockers and
neprilysin inhibitors.

If your symptoms do not go away, you should do the following:

- Hydralazine / nitrate combination
- Diuretics (drugs) and
- digoxin
- Aldosterone Inhibitors.

If Your Symptoms Have Ever Been Severe With Other Treatments Soluble guanylate cyclase (sGC) stimulant Devices such as biventricular pacemakers and implantable cardioverter-defibrillators (ICDs) are useful.

You may also need to change some things in your daily life:

- Let's reduce the salt content.
- If you are overweight, lose weight.
- Drink less liquid if needed.
- Stop the medicines that are making your condition worse.

Level D

If you have systolic heart failure and advanced symptoms after treatment, you are at this stage.

Some treatments for stages A, B, and C also help stage D.

Your doctor may also discuss the following:

Heart transplant

Ventricular assist device

Surgical options

Continuous infusion of intravenous innotropic.

ETIOLOGY

- Coronary artery disease (CHD), narrowing or obstruction of small blood vessels that supply blood and oxygen to the heart. This can weaken the heart muscle over time or suddenly.
- Uncontrolled high blood pressure can lead to stiffness problems or ultimately weakness.
- Heart failure is caused by structural abnormalities, dysfunctions, and other triggering factors in the heart. In the past, the overwhelming majority of cases were due to coronary artery disease and myocardial infarction. Over time, coronary artery disease and diabetes have emerged as major predisposing factors for heart failure.
- Other structural causes of congestive heart failure (CHF) include hypertension, valvular heart disease, uncontrolled arrhythmias, myocarditis, and congenital heart disease.
- Diastolic heart failure with impaired ventricular filling can be caused by restrictive cardiomyopathy and constrictive pericarditis, in addition to the etiology identified above.
- Other heart problems that can cause heart failure are:

- Congenital heart disease
- Heart attack (when coronary artery disease causes a sudden occlusion of the arteries of the heart)
- Leaking or narrowing heart valve
- Infections that weaken the heart muscle
- Some types of abnormal heart rhythm (arrhythmia).

✓ Other illnesses that can or may cause heart failure:

- Amyloidosis
- Emphysema
- hyperthyroidism
- sarcoidosis
- Severe anemia
- Too much iron in the body
- Hypothyroidism

Signs and symptoms of heart failure include:

- Shortness of breath when active or lying down.
- Fatigue and weakness.
- Swelling of the feet, ankles, and feet.
- Fast or arrhythmia.
- Decreased training ability.
- Persistent cough or wheezing with white or pink bloody sputum.
- Swelling of the abdomen (tummy)
- Very rapid weight gain due to fluid retention
- Nausea and loss of appetite
- Poor concentration or diminished attention
- Chest pain when heart failure is caused by a heart attack.

Risk factor

A single risk factor may be sufficient to cause heart failure, but a combination of factors also increases your risk.
The risk factors for heart failure are:

- ***Coronary heart disease***: Narrowing of the arteries limits the supply of oxygen-rich blood to the heart and can weaken the heart muscle.
- ***Heart attack:*** A heart attack is a type of sudden coronary artery disease.
  Damage to the heart muscle from a heart attack can prevent the heart from pumping normally.
- ***Valvular heart disease***.
  When the heart valves become dysfunctional, there is an increased risk of heart failure.
- ***High blood pressure:-***When your blood pressure is high, your heart works more than you need.
- ***Arrhythmia***: These abnormal rhythms can weaken the heart muscle and cause heart failure, especially if it is frequent and fast.

- ***Congenital heart disease:-***Some people who develop heart failure are born with problems that affect the structure and function of the heart.
- ***Diabetes:-***Diabetes increases the risk of high blood pressure and coronary artery disease.
  Do not stop taking the medicine yourself.
  Talk to your doctor if you need to make any changes.
- ***Some diabetes drugs:-*** The diabetes medications rosiglitazone (Avandia) and pioglitazone (Actos) have been shown to increase the risk of heart failure in some people. However, do not stop taking these medicines yourself. If you are taking them, talk to your doctor if any changes are needed.
- ***Other specific medicines:-*** Some medicines can cause heart failure and heart problems.
  These include
  - Non-steroidal anti-inflammatory drugs (NSAIDs).
  - Specific anesthetics; specific drugs used to treat hypertension, cancer, blood disorders, irregular or abnormal heartbeats, nervous system disorders, psychiatric disorders, lung and urinary tract problems, inflammatory diseases, and infections.
  - Alcohol consumption:- Too much alcohol can weaken the heart muscle and lead to heart failure.
  - Sleep Apnea
  - Failure to breathe properly during sleep reduces blood oxygen levels and increases the risk of arrhythmias.
  - Both problems can weaken the heart.
  - Smoking or use of tobacco.
  - Stop smoking if you smoke.
  - The use of tobacco increases the risk of heart disease and heart failure.
  - Obesity:- Obese people are at increased risk of developing heart failure.

- Virus:- Certain viral infections can damage the heart muscle.

Diagnosis of Heart failure

The evaluation for HF is performed using various parameters: physical examination to determine the presence of clinical symptoms and signs, blood tests, including complete blood count, urinalysis, complete metabolic profile for levels of serum electrolytes (including calcium and magnesium), blood urea nitrogen, serum creatinine, glucose, fasting lipid profile, liver function tests and thyroid-stimulating hormone.

Other HF-specific laboratory tests (especially in patients with a high possibility of heart failure) include brain natriuretic peptide (BNP) with 70% sensitivity and 99% specificity and *N*-terminal proBNP (NT-proBNP) with 99% sensitivity and 85% specificity, the measurement which has been recommended both in outpatient and in the hospital settings [1]. BNP is a neuro-hormone, which is an activated form of proBNP, the 108-amino acid polypeptide precursor, stored as secretory granules in both ventricles and, to a lesser extent, in the atria. In response to volume expansion and pressure overload, proBNP is secreted into ventricles and breaks down into its two cleaved forms, the 76-peptide, biologically-inert *N*-terminal fragment, NT-proBNP, and the 32-peptide, biologically-active hormone BNP.

NT-proBNP and BNP have clinical significance both as diagnostic and prognostic markers in the management of HF. During the diagnosis of HF, in patients presenting with acute dyspnea, BNP levels of less than 100 pg/mL have a 90% negative predictive value (NPV), and values of more than 500 pg/mL have an 81% positive predictive value (PPV) [25]. The BNP level is a strong predictor of risk of death and cardiovascular events in patients previously diagnosed with heart failure or cardiac dysfunction. It is to be remembered that elevated BNP levels have also been associated with renal failure, pulmonary embolism, pulmonary hypertension and chronic hypoxia while obese and overweight individuals have relatively lower BNP levels. Furthermore, there has been no clinically significant difference between BNP and NT-proBNP in terms of the diagnostic and prognostic values, except for the longer half-life time of NT-proBNP (72 h) as opposed to 4 h for BNP and that NT-pro-BNP levels are less affected by obesity [9,26].

A recent review by Simons et al. discussed the criteria and cut off values for the diagnosis, prognosis and treatment guidance [27]. Accordingly, single measurement of natriuretic peptides (BNP ≤ 100 pg/mL or NTproBNP ≤ 300 pg/mL) rules out HF clinically, while BNP ≥ 500 pg/mL or NTproBNP ≥ 1800 pg/mL has been proposed to have a relatively lower level of evidence in clinical settings. Nevertheless, both BNP and NT-proBNP levels aid in decisions regarding admission/ discharge and risk stratification for HF patients. Patients with BNP level of less than 200 pg/mL at admission have been associated with 2% mortality rate as opposed to 9% mortality rate seen in patients with admission BNP level of more than 200 pg/mL [28]. NT-proBNP level equal to or higher than 5000 pg/mL at admission has been shown to be associated with in-hospital mortality rate of 22.5% and longer length of stay in remaining surviving patients [29].

Biomarkers not only provide valuable information about the pathophysiology of the disease, but also shed light on the severity of ongoing disease. As far as biomarkers for HF are concerned, the National Academy of Clinical Biochemistry has set forth comparable goals in a consensus document stating that a biomarker in HF ideally enables clinicians to: (i) identify possible underlying (and potentially reversible) causes of HF; (ii) confirm the presence or absence of the HF syndrome; and (iii) estimate the severity of HF and the risk of disease progression.

Myocardial Stress	**Myocardial Injury**	**Matrix and Cellular Remodeling**	**Inflammation**	**Oxidative Stress**	**Neuro-Hormones**	**Vascular System**	**Cardio-Renal Syndrome**
Natriuretic	Cardiac troponins	Osteopontin	C-reactive protein	Oxidized LDL	Nor-epinephrine	Homocysteine	Creatinine
peptides	High sensitivity cardiac troponins	Galectin-3	sST2	Myeloperoxidase	Renin	Adhesion molecules	Cystatin C
Mid-regional	Myosin light-chain kinase 1	sST2	Tumor necrosis factor	Urinary biopyrrins	Angiotensin-II	ICAM, P-selectin	NGAL
Pro-adrenomedullin	Heart-type fatty acid binding protein	GDF-15	FAS (APO-1)	Urinary and plasma isoprostanes	Co-peptin	Endothelin	Trace protein
Neuregulin	Pentraxin 3	MMPs	GDF-15	Plasma malondialdehyde	Endothelin	Adiponectin	
sST2		TIMPs	Pentraxin 3			C-type natriuretic peptide	

Collagen propeptides	Adipokines
	cytokines
	Procalcitonin
	Osteoprotegerin

Multiple biomarkers have been classified depending on their putative functional impact on cardiac myocytes and the resulting pathophysiological changes in patients with HF and include (a) myocyte stretch biomarkers; (b) myocyte necrosis biomarkers; (c) systemic inflammation biomarkers; (d) oxidative stress biomarkers; (e) extracellular matrix turnover biomarkers; (f) neuro-hormone biomarkers; and (g) biomarkers of extra-cardiac processes, such as renal function. The specific biomarkers are shown in Table 1 along underlying mechanisms.

The specific biomarkers expressed in heart failure (HF) patients as they correlate to the underlying mechanism of the pathogenesis for HF could be utilized for the diagnosis and prognosis of HF. Adapted from Ahmad et al., 2012 [30]. APO, apoptosis antigen; GDF, growth differentiation factor; ICAM, intercellular adhesion molecule; MMPs, matrix metalloproteinases; NGAL, neutrophil gelatinase-associated lipocalin; sST2, soluble ST2; TIMPs, matrix metalloproteinase tissue inhibitors.

Quality Improvement Strategies for Heart Failure

We have achieved great success in the optimization of pharmacological therapy along with the relative increase in the availability of better healthcare options. This has led to the reduction in the mortality in comparison to one seen in the 1970s [19]. On the contrary, this has led to rise in prevalence of HF and proportionate increase in the burden on the healthcare system, especially when associated with extended and frequent readmissions. The long-term goal of the treatment and management of HF is to avoid exacerbation of HF and to decrease the hospital readmission rate. The achievement of this goal encompasses an interdisciplinary approach involving patients and their physicians, nurses, family and care takers. Various reports have discussed the strategies to improve the overall quality of care of the patients of HF [11,60,63,64].
We have tried to summarize the crucial ones below.

- ***Patient education:***
  - patient education about HF and strategies for its treatment.
  - dietary counseling about sodium (2–3 gm/day; <2 gm/day may be considered in moderate to severe heart failure) and fluid restriction <2 L/day is considered when the fluid retention persists and when severe hyponatremia (serum Na <130 mEq/L) is present.
  - healthy lifestyle changes (high fiber diet with vegetables; regular exercise in a tolerable amount under monitoring of a cardiac rehabilitation program; consuming alcohol in moderation and no smoking); especially, recent studies have advocated the importance of exercise training to HF patients via improvement in the skeletal muscle O_2 delivery, while simultaneously correcting mitochondrial and contractile efficiency. The localized muscle training has been shown to improve convective and diffusive O_2 transport in HF and, hence, is useful for patients with minimal lung reserve capacity; several variables, such as exercise type, duration, frequency, intensity, etc., need to be taken into consideration to best benefit from such training [56,65,66].
  - efforts to improve patients' compliance with medical regimens and interventions, such as phone calls, reminders and home nurse, to help patients remember to take the medications.
  - understand the alarming signs and symptoms, such shortness of breath, excessive fatigue, swelling of feet/ankle, etc. [11].

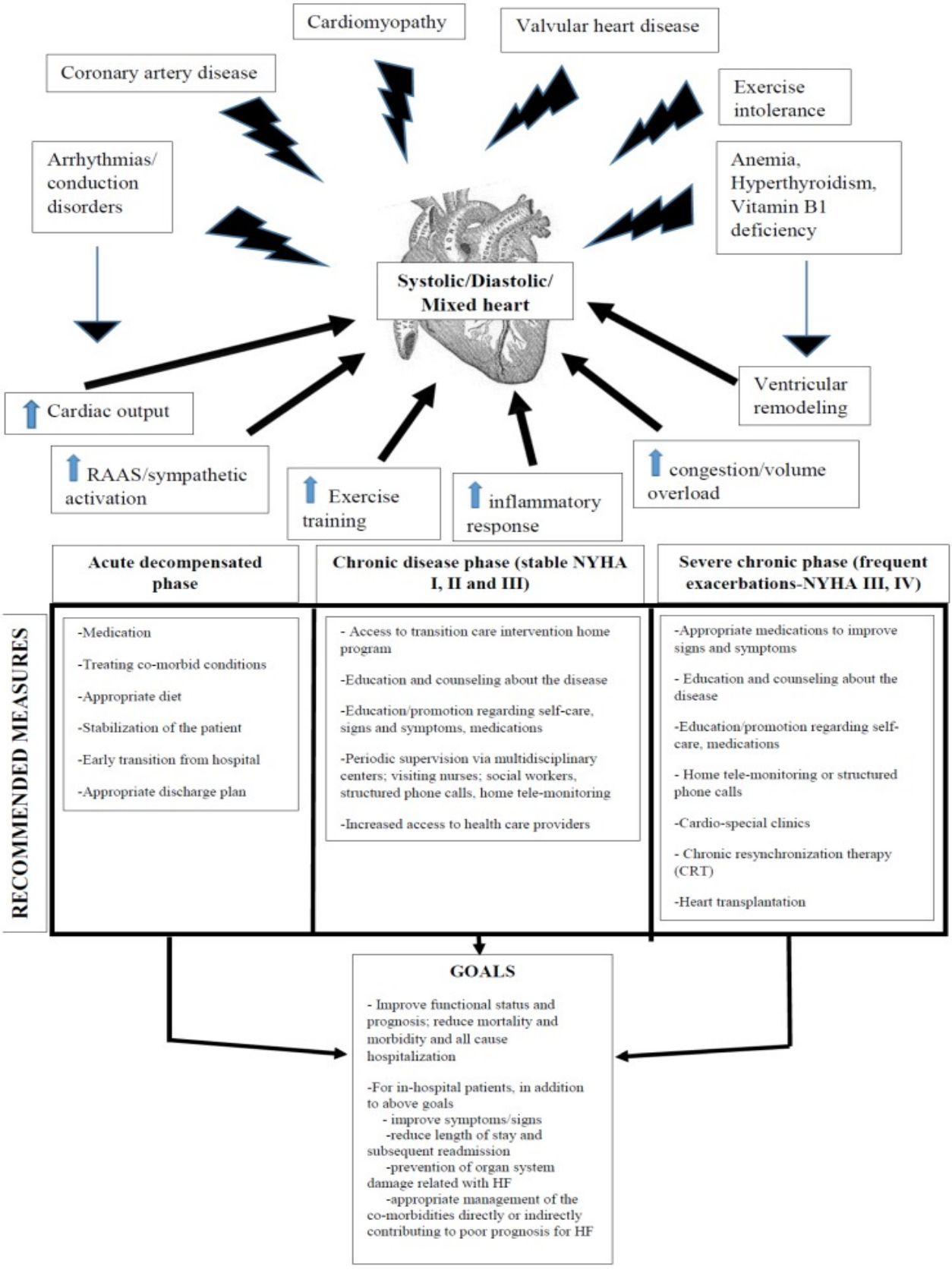
- ***Arranging follow-up care***: This includes assistance in scheduling the first follow-up appointment post-hospitalization along with re-enforcement of the importance of other follow-up visits. It also includes documentation of the date, time and location of the follow-up visit on the discharge plan, as well as sending reminders for subsequent appointments. One recent study has shown that it is possible to predict the readmission based on the response of the patients on the automated follow-up questionnaire [67].

- ***Home tele-monitoring***: This is a unique approach where the transmission of clinical parameters and symptoms of patients with HF at home to their healthcare provider, such as weight, blood pressure, heart rate, oxygen saturation, along with patients queries and questions regarding medications and symptoms and signs is conducted, thereby titrating the therapy based on the symptoms and signs. A few studies have shown that home tele-monitoring reduces mortality and hospitalizations, while in other studies, home tele-monitoring was found to be equivalent to telephone calls by a nurse [57].

- ***Transition home program:*** This helps patients to have a safe transition to home or to another healthcare setting, such as a skilled nursing facility, and includes thorough patient and caregiver education, enhanced individualized assessment of post-discharge needs, patient-centered communication with caregivers and a standardized process for further management of HF along with follow-up visits with healthcare professionals [59,60,68].

- ***Nurse assurance program:*** This program facilitates home service to follow-up on the patients with HF [58].

❖ ***Specialized referral or health centers:*** This is designed to provide personalized care to HF patients with thorough assessment for heart transplantation needs. The referral to an HF program is shown to result in a decrease in the frequency of hospitalization of ≈50% [59,68].



Conclusions

Heart failure indeed is a complex disease and so far has been a major cause of morbidity and mortality in developing and developed countries. A standardized medical therapy has been successful in the early stages of HF. Advanced stages of HF require frequent hospitalization due to the presence of severe HF and or associated co-morbid conditions, which require strict implementation of an appropriately individualized multidisciplinary approach and quality measures to reduce re-admissions.

While pharmacological management has a limited role in advanced cases of HF, novel therapeutic agents, such as regenerative and gene therapy, are in the developmental stages and need further refinement before their approval for the treatment of HF. Despite the appropriate measures, hospitalization in HF as a DRG has been a great challenge, especially since the adoption of the financial penalty program for excessive readmissions related to HF. In addition to the appropriate management of cases, healthcare professionals also need to provide precise and complete medical codes for procedures and diagnosis to help hospitals to receive the maximum reimbursement for the services provided to such patients.

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