HEART FAILURE CLINICAL GUIDANCE

Foundational Concepts

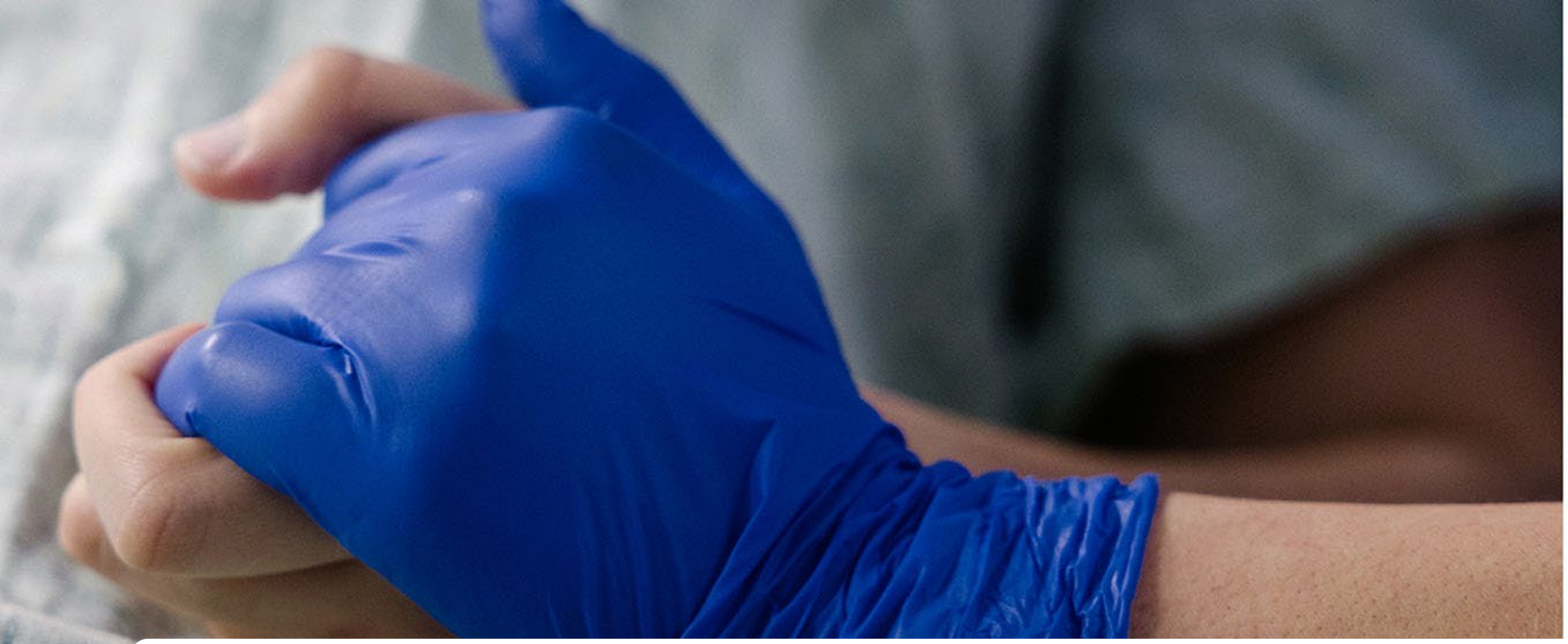
A HIGHER LEVEL OF CARE

ST. JOSEPH'S HEALTH
A Member of Trinity Health

Heart Failure Defined

IN 2021, THE JOURNAL OF CARDIAC FAILURE PROPOSED THE FOLLOWING UNIVERSAL DEFINITION OF HEART FAILURE (HF):

HF is a clinical syndrome with symptoms and/or signs caused by a structural and/or functional cardiac abnormality and corroborated by elevated natriuretic peptide levels and/or objective evidence of pulmonary or systemic congestion.



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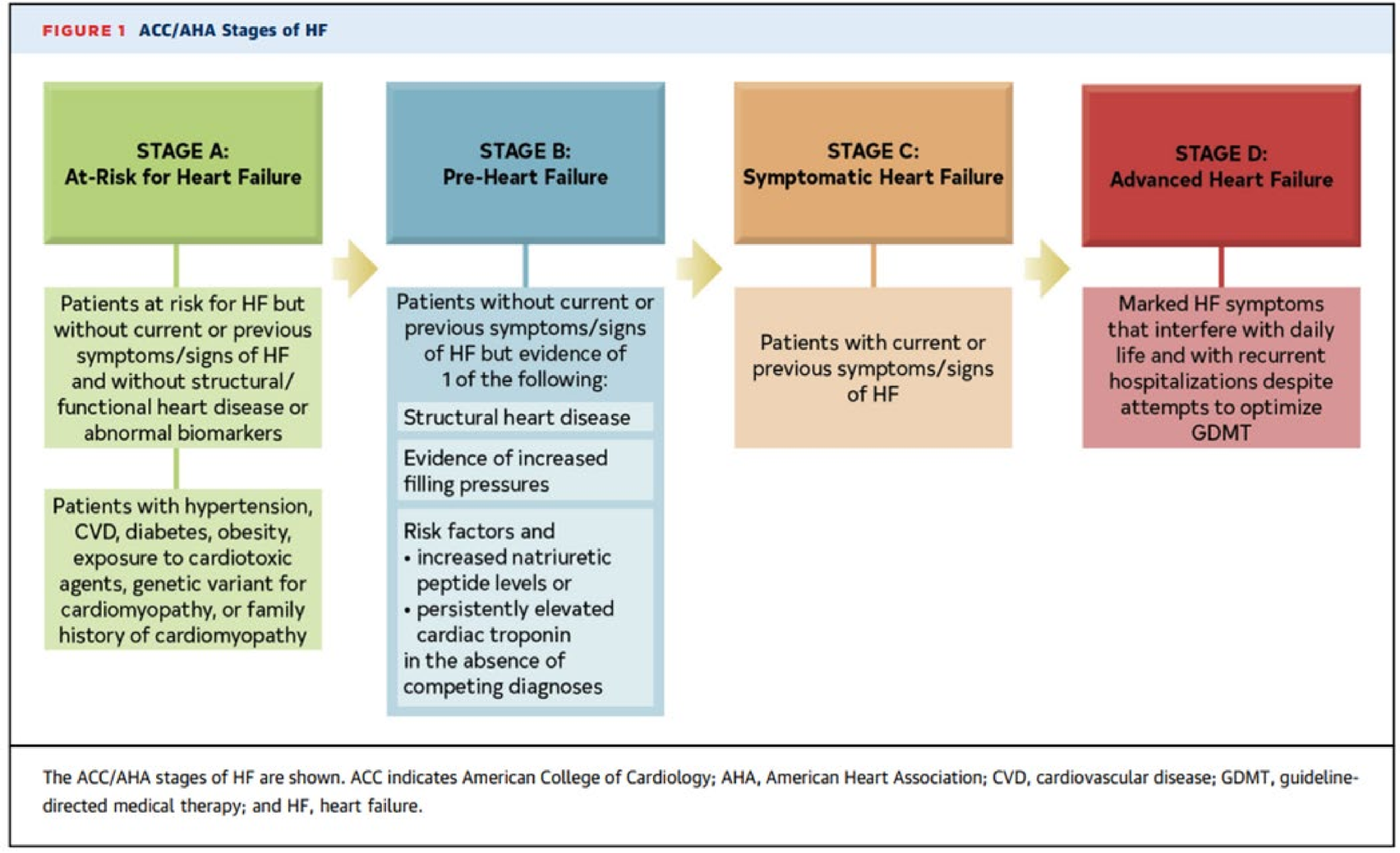
STAGES OF HEART FAILURE

Primarily Responsible Providers and Heart Failure Classifications

Primarily Responsible Providers and Stages

Primarily Responsible Providers

- Stage A – Primary Care Provider
- Stage B – Cardiologist and Primary Care Provider
- Stage C – Cardiologist and heart failure disease management program
  - Consider referral to Advanced Heart Failure Clinic
- Stage D – Cardiologist and Advanced Heart Failure Clinic



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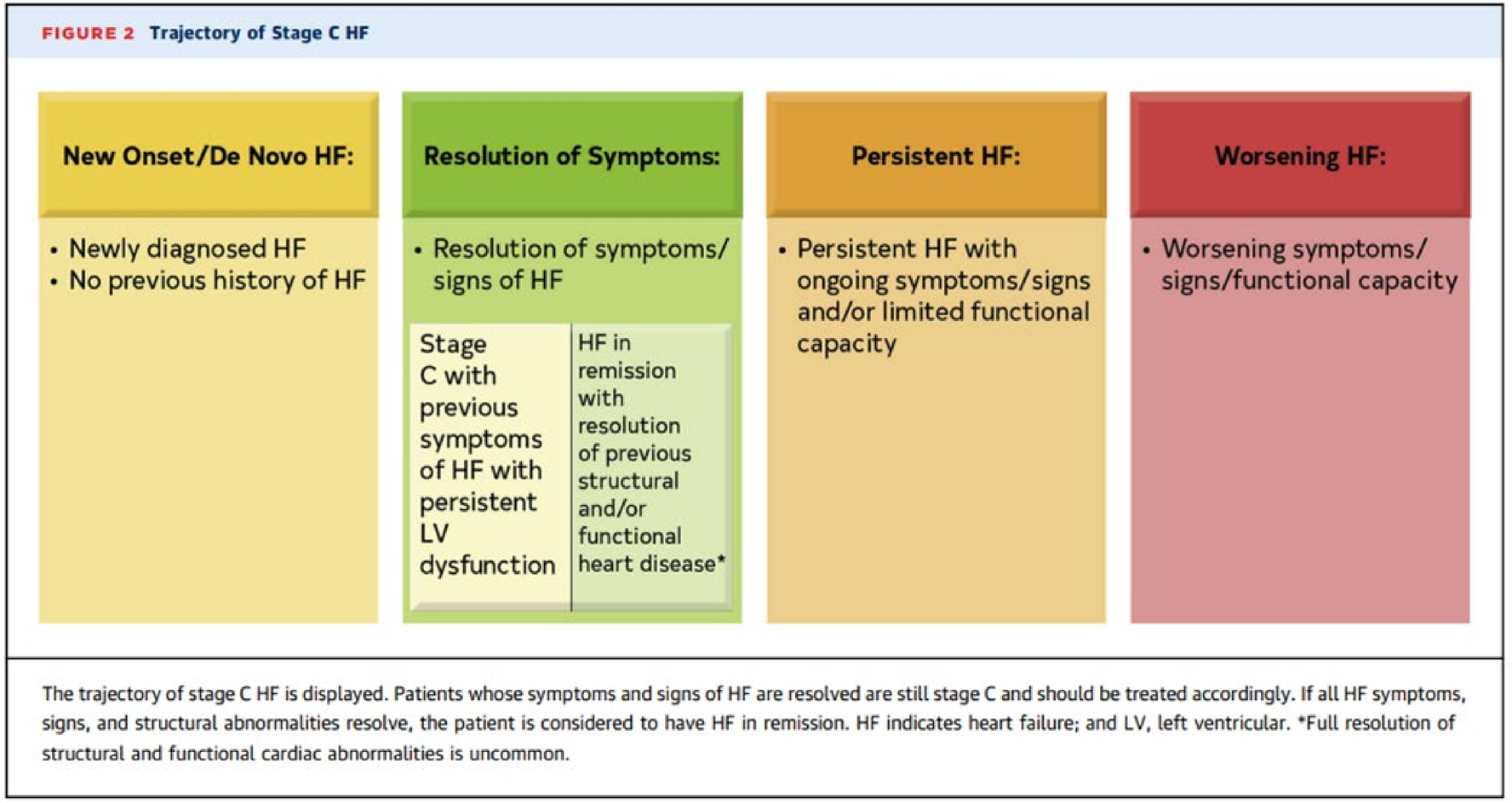
Trajectory of Stage C HF and HF Classifications



Heidenreich, P., Bozkurt, B., 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure. Journal of the American College of Cardiology

HF Classification

Classification of Heart Failure according to Ejection Fraction	
HF with reduced LVEF (HFrEF)	LVEF < 40% - ICD10 I50.2
HF with mildly reduced EF (HFmrEF)	EF 41-49%
HF with preserved EF (HFpEF)	EF > 50% - ICD10 I50.3
HF with improved EF (HFimpEF)	HF with baseline LVEF < 40% and a > 10-point increase from baseline LVEF, and a second measurement of LVEF > 40%

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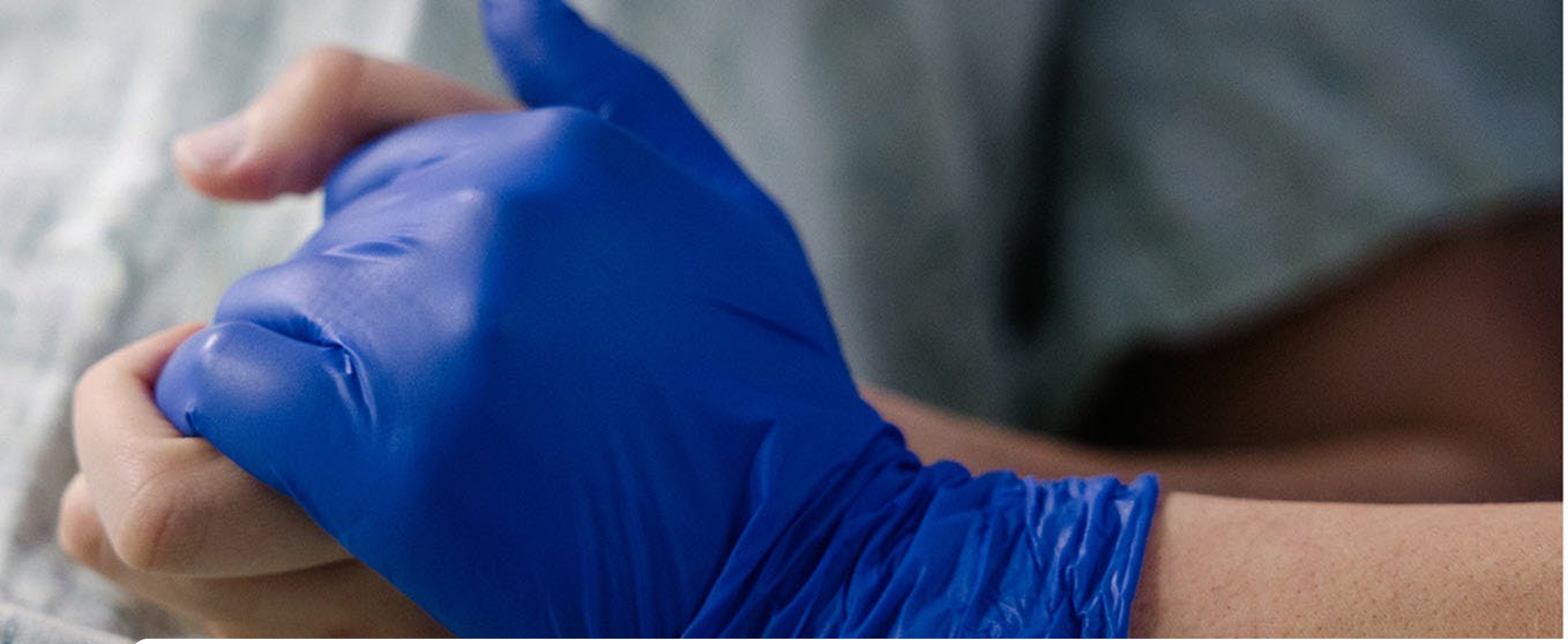

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HEART FAILURE DIAGNOSIS

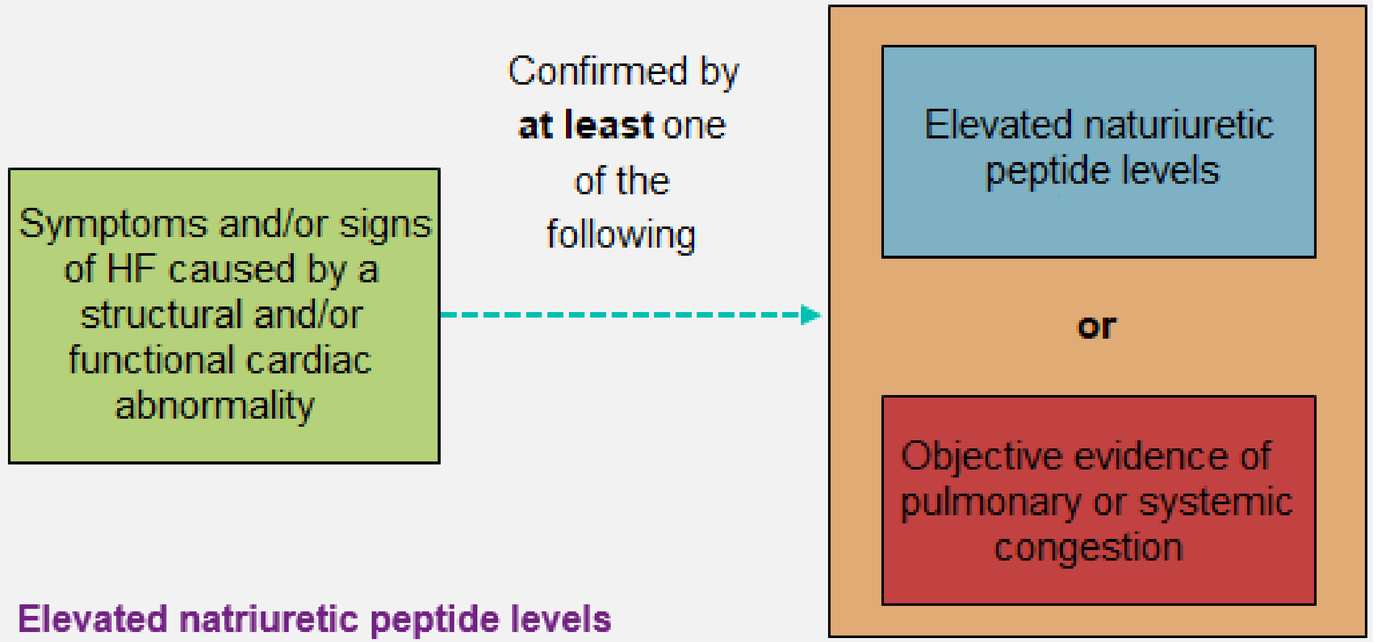
Diagnosis
Symptoms and Signs

Diagnosis

B-type natriuretic peptide (BNP) is a hormone produced by your heart.

N-terminal (NT)-pro hormone BNP (NT-proBNP) is a non-active prohormone that is released from the same molecule that produces BNP.

Both BNP and NT-proBNP can be useful in the diagnosis and on-going treatment of heart failure.



Elevated natriuretic peptide levels

	Ambulatory	Hospitalized/ Decompensated
BNP*, pg/mL	≥ 35	≥ 100
NT-proBNP*, pg/mL	≥ 125	≥ 300

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Symptoms and Signs

Symptoms and Signs

- Breathlessness
- Orthopnea
- Paroxysmal nocturnal dyspnea
- Reduced exercise tolerance
- Inability to exercise
- Fatigue, tiredness
- Ankle swelling
- Loss of appetite
- Abdominal distension
- Swelling of parts of the body other than ankles
- Bendopnea (shortness of breath when bending)

Structural and/or functional cardiac abnormalities seen in heart failure

Ejection fraction of < 50%, abnormal cardiac chamber enlargement (left atrial enlargement), E/e' of > 15*, moderate/severe hypertrophy, or moderate/severe valvular obstructive or regurgitant lesion.

*E/e'>15, reported as part of the diastolic function of echocardiogram, indicates increased cardiac filling pressures.

Objective evidence of pulmonary or systemic congestion seen in heart failure

As evidenced by diagnostic modalities such as imaging or hemodynamic measurement

- Chest Xray
- Bedside lung ultrasound
- Right heart catheterization / pulmonary artery catheter

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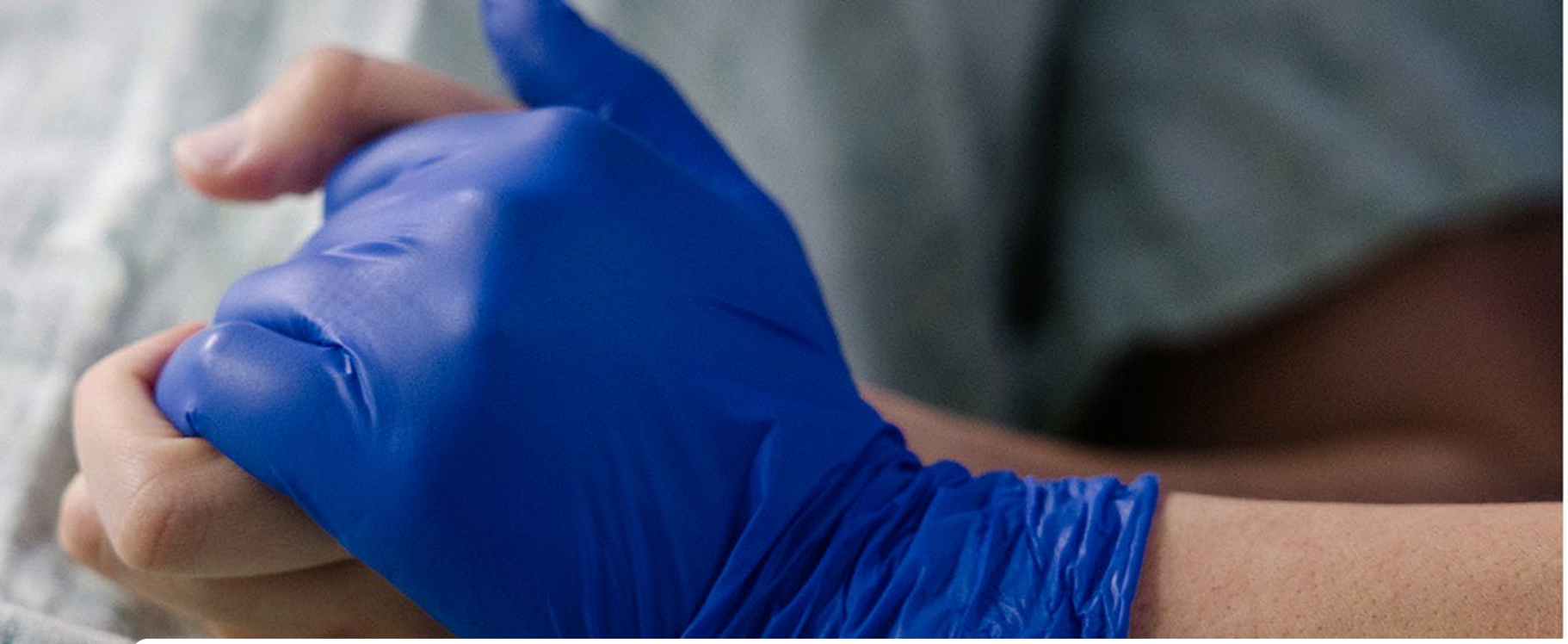


STANDARD DIAGNOSTIC WORKFLOW

History and Physical Exam
Initial Diagnostic Testing

History and Physical Exam

History

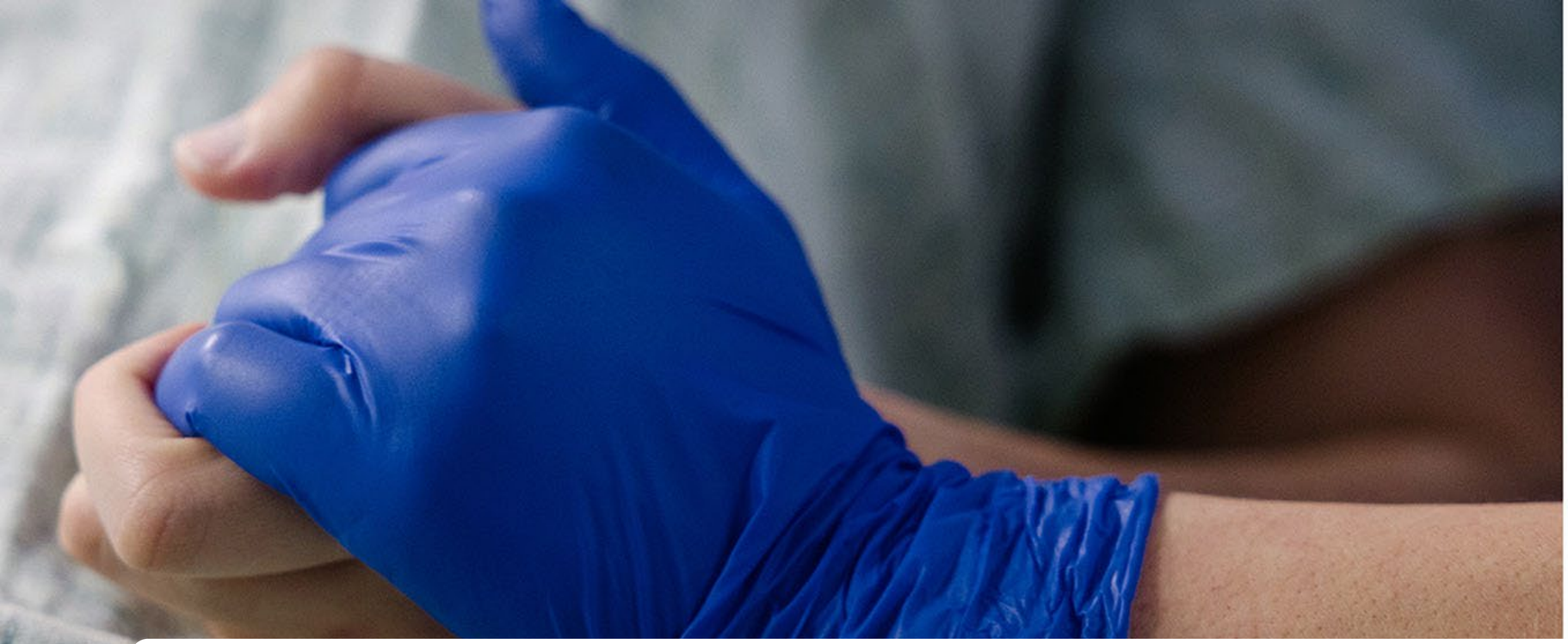
- Clues suggesting HF etiology
  - Family history of cardiomyopathy or other cardiac diseases
  - Alcohol intake (EtOH cardiomyopathy)
  - Palpitations (tachycardic induced)
  - History of:
    - CAD (coronary artery disease)
    - DM (diabetes mellitus)
    - HTN (hypertension)
    - tobacco use
    - family history
    - pregnancy history specifically the history of pre-eclampsia, recent or current pregnancy
- What is the duration of illness?
- What are the severity and triggers for the patient's dyspnea and fatigue?
- Is there chest pain?
- What is the patient's exercise capacity, physical activity, and sexual activity?
- Is/are there:
  - Anorexia and early satiety, weight loss
  - Weight gain
  - Palpitations, syncope or pre-syncope, ICD shocks (if relevant)
  - Symptoms suggesting transient ischemic attack or thromboembolism
  - Peripheral edema or ascites
  - Disordered breathing at night, sleep problems
- Have there been recent or frequent prior hospitalizations for HF?
- Is the patient adherent to his/her medical regimen?
- Is there a history of discontinuation of medications for HF?
- Does the patient take medications that may exacerbate HF (such as nonsteroidal anti-inflammatory drugs or steroids)?
- What is the patient's diet?

Physical Exam

- Body Mass Index (BMI); is there evidence of weight loss?
- Blood pressure (supine and upright)
- Pulse
- Examination for orthostatic changes in blood pressure and heart rate
- Jugular venous pressure at rest and following abdominal compression
- The presence of extra heart sounds and murmurs
- Size and location of the point of maximal impulse
- Presence of right ventricular heave
- Pulmonary status: respiratory rate, rales, pleural effusion
- Hepatomegaly and/or ascites
- Peripheral edema
- Coolness of lower extremities

Initial Diagnostic Testing

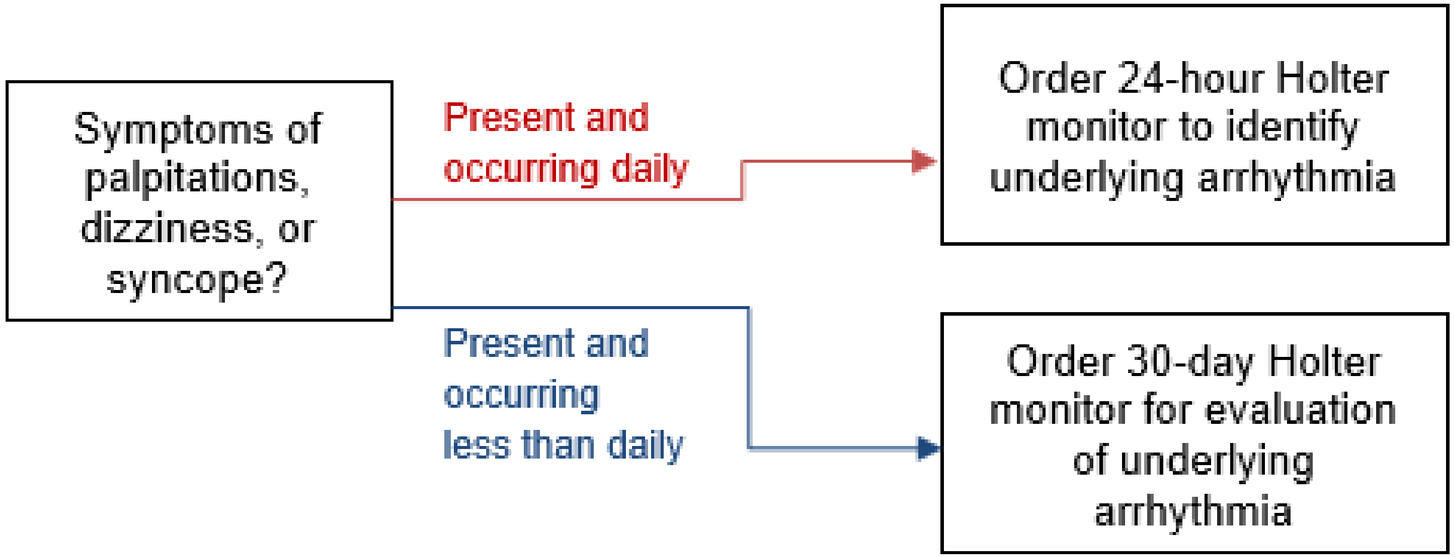
- Complete blood count, serum electrolytes (including calcium and magnesium), blood urea nitrogen, serum creatinine, glucose, fasting lipid profile, liver function tests, natriuretic peptide, thyroid stimulating hormone, urinalysis
- Screening for hemochromatosis and Human Immunodeficiency Virus (HIV) in select patients
- Diagnostic tests for rheumatologic disease if clinical suspicion
- *A 12-lead ECG should be performed on all patients presenting with HF*
- Chest x-ray to assess heart size and pulmonary congestion and to detect alternative cardiac, pulmonary, and other diseases
- 2-dimensional echocardiogram with doppler to assess ventricular function, size, wall thickness, wall motion, and valve function
- Noninvasive imaging to detect myocardial ischemia and viability in patients presenting with de novo HF



ETIOLOGY

Presence of Arrhythmia
Presence of Ischemia

Presence of Arrhythmia



Note: If baseline ECG notes an arrhythmia or frequent premature ventricular contractions, evaluate further for arrhythmic etiology with prolonged cardiac monitoring (Holter monitor) as stated (left diagram)

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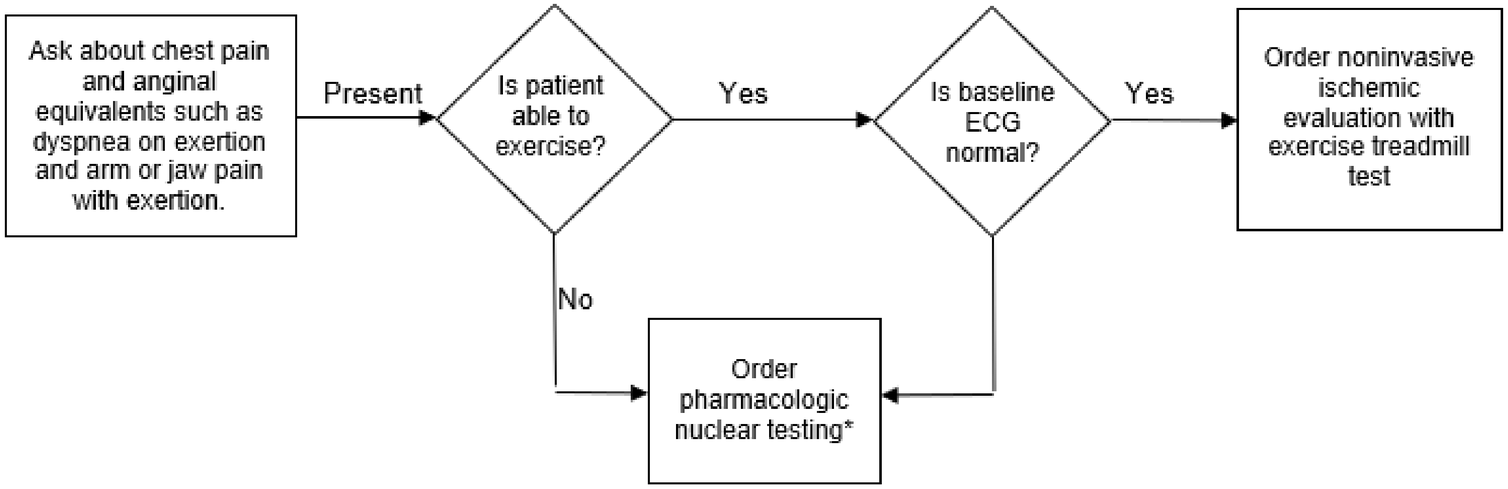
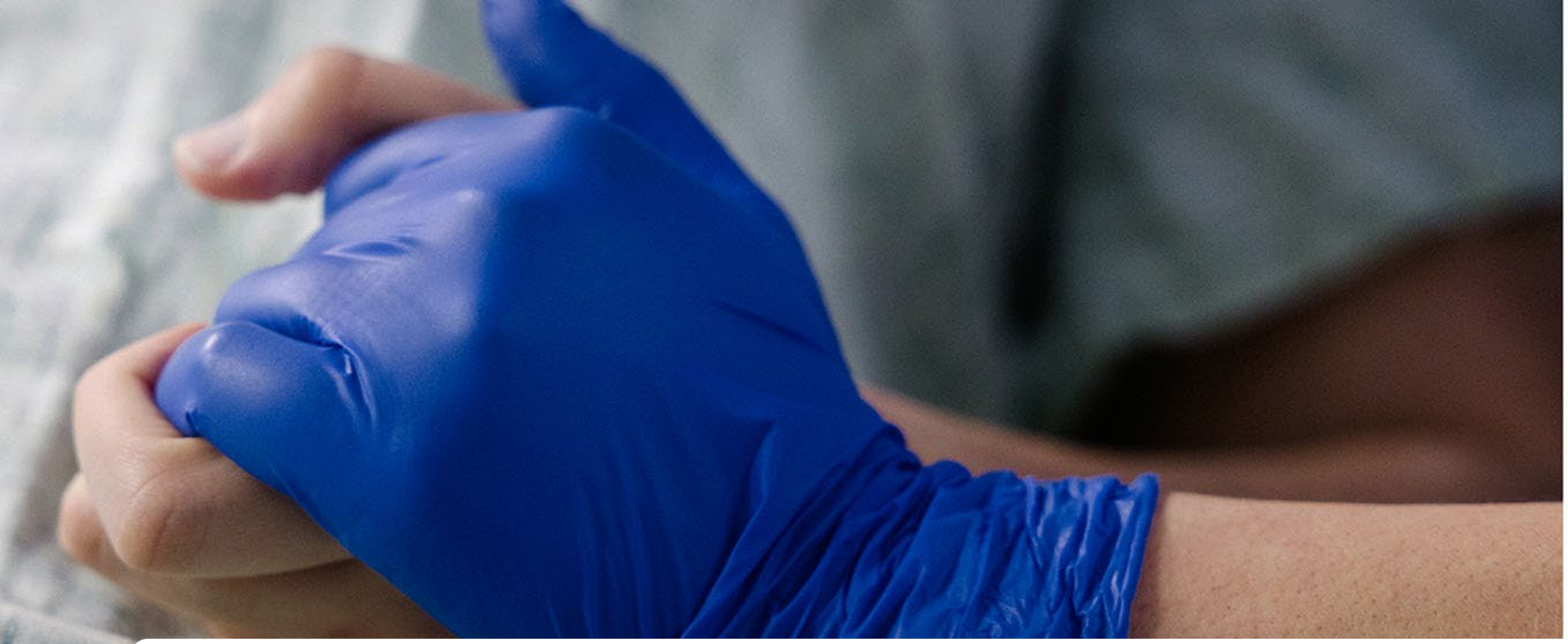
Presence of Ischemia



**Providers should order Lexiscan for the pharmacologic testing*

If short- and long-term monitoring is unrevealing and suspicion remains, consider the use of an implantable cardiac monitor.

If there is a concern for the acute coronary syndrome, the patient should be evaluated in the Emergency Department. For the evaluation of chronic ischemic as an underlying etiology of heart failure, the patient should undergo screening for coronary artery disease. All **patients with heart failure with reduced ejection fraction should be under cardiology care and should undergo ischemic testing.** There should be a low threshold for ischemic testing in patients with HFpEF, especially if symptoms persist despite initial treatment.



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TREATMENT

Heart Failure Clinics Discharge

Initial Treatment

- Treat signs/symptoms of congestion with diuretics
  - Monitor serum potassium levels
- Treat comorbidities including hypertension, diabetes
- Provide guidance on a healthy lifestyle
- Medication considerations
  - For all categories of EF, prescribe (in the absence of contraindications)
    - An Angiotensin Receptor Neprilysin Inhibitor (ARNI), i.e. sacubitril/valsartan (Entresto)
    - Spironolactone
    - SGLT-2 inhibitors
  - For those with HFrEF, prescribe and up titrate to maximally tolerated doses (in the absence of contraindications):
    - Evidence-based beta-blockers, such as carvedilol, metoprolol succinate, bisoprolol
    - Hydralazines and nitrates for self-declared African Americans
    - For those intolerant of an ARNI, substitute with an angiotensin-converting enzyme inhibitor (ACEi) or Angiotensin Receptor Blocker (ARB)
  - Medications to avoid in patients with HFrEF
    - Calcium channel blockers (except amlodipine)
    - Nonsteroidal anti-inflammatory drugs (NSAIDs)
    - Thiazolidinediones

Cardiology

Evaluation by Cardiologist

- **All patients with a new diagnosis of heart failure or with acute decompensation requiring hospitalization must be referred to cardiology for evaluation.**
- **Ideally, patients should be seen by a cardiologist or heart failure clinic within 7 days of any heart failure discharge or referral.**
- **Management should be a shared responsibility between Primary Care Providers (PCP) and cardiologists.**
- Consider noninvasive or invasive ischemic evaluation depending upon clinical symptoms and prior diagnosis of CAD
- Invasive hemodynamic monitoring with right heart catheterization can be useful in patients who have HF and persistent and severe symptoms despite empiric adjustment of standard therapies
- Consider further evaluation into the underlying etiology of HF
- Consider further studies to evaluate underlying vascular diseases such as renal artery stenosis (RAS)

When to Refer to Cardiology

- **A new diagnosis of heart failure**
- Congestive heart failure symptoms
- A new inpatient admission for congestive heart failure (CHF)
- A positive stress test in the setting of CHF

Treatment by Cardiologist

- Optimize Guideline-Directed Medical Therapy (GDMT) or refer to a GDMT clinic to co-manage with PCP (in person or via telehealth)
- Ensure evaluation for CAD has been performed and re-perform and/or consider revascularization as appropriate
- Consider evaluation and referral for implantation of an implanted cardiac defibrillator (ICD) if LVEF < 35% at least 40 days post-MI or LVEF < 35% despite 3 months of optimal GDMT
- Consider remote patient monitoring, implantable ambulatory pulmonary artery device

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Heart Failure Clinics

Candidates for Advanced Heart Failure Specialty Clinic

Those with

- Repeated (>2) hospitalizations or ED visits for CHF in the past year
- Progressive deterioration in renal function (e.g., rise in blood urea nitrogen (BUN) and creatinine)
- Weight loss without other causes
- Intolerance to ACE inhibitors due to hypotension and/or worsening renal function
- Intolerance to beta blockers due to worsening HF or hypotension
- Frequent systolic blood pressures <90mm Hg
- Persistent dyspnea upon dressing or bathing, requiring rest
- Inability to walk 1 block on the level ground due to dyspnea or fatigue
- Recent need to escalate diuretics to maintain volume status, often reaching daily furosemide equivalent dose >160mg/d and/or use of supplemental metolazone therapy
- Progressive decline in serum sodium, usually to <133mEq/L
- Frequent ICD shocks

Advanced Heart Failure Clinics

Can help with:

- Co-management
- Consideration of advanced therapies (heart transplantation, mechanical circulatory support)
- Persistent or worsening symptoms
- Consideration for endomyocardial biopsy
- Addressing worsening renal function
- Consideration for genetic testing when appropriate
- Diuretic dose escalation
- Those with recurrent hospital readmissions, recurrent ED visits

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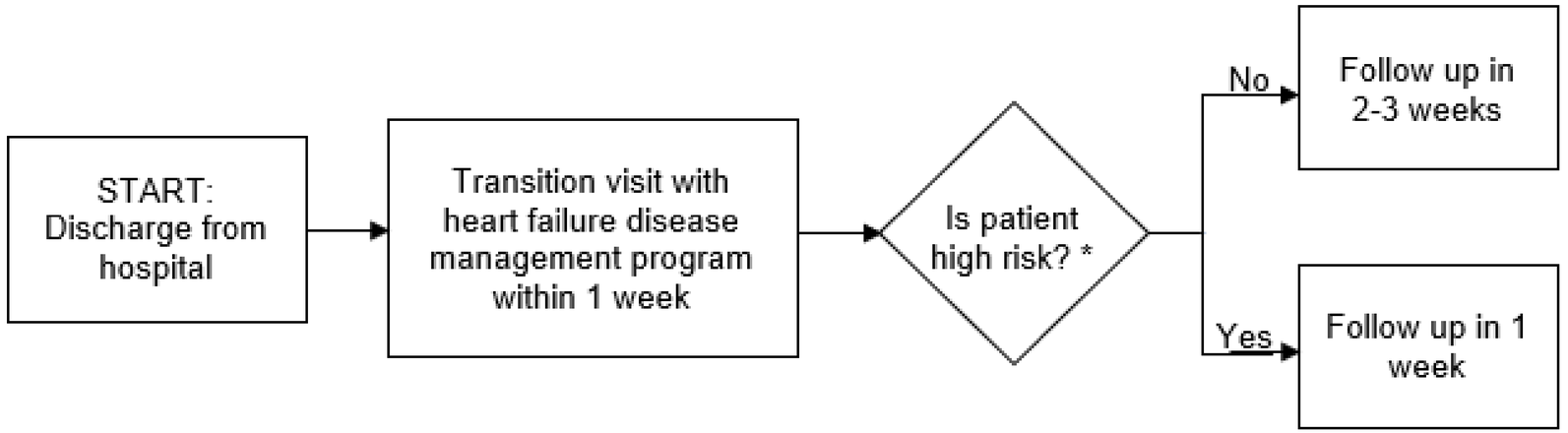
Hospital Discharge Follow-up and Flow

When a patient is discharged from the hospital, the patient should receive a heart-failure-specific follow-up phone call within 72 hours of discharge. The patient's first appointment with a provider should occur within 1 week of discharge.

- A metabolic panel is required post-discharge
- Document a patient's discharge weight so it can be tracked and followed up during subsequent visits



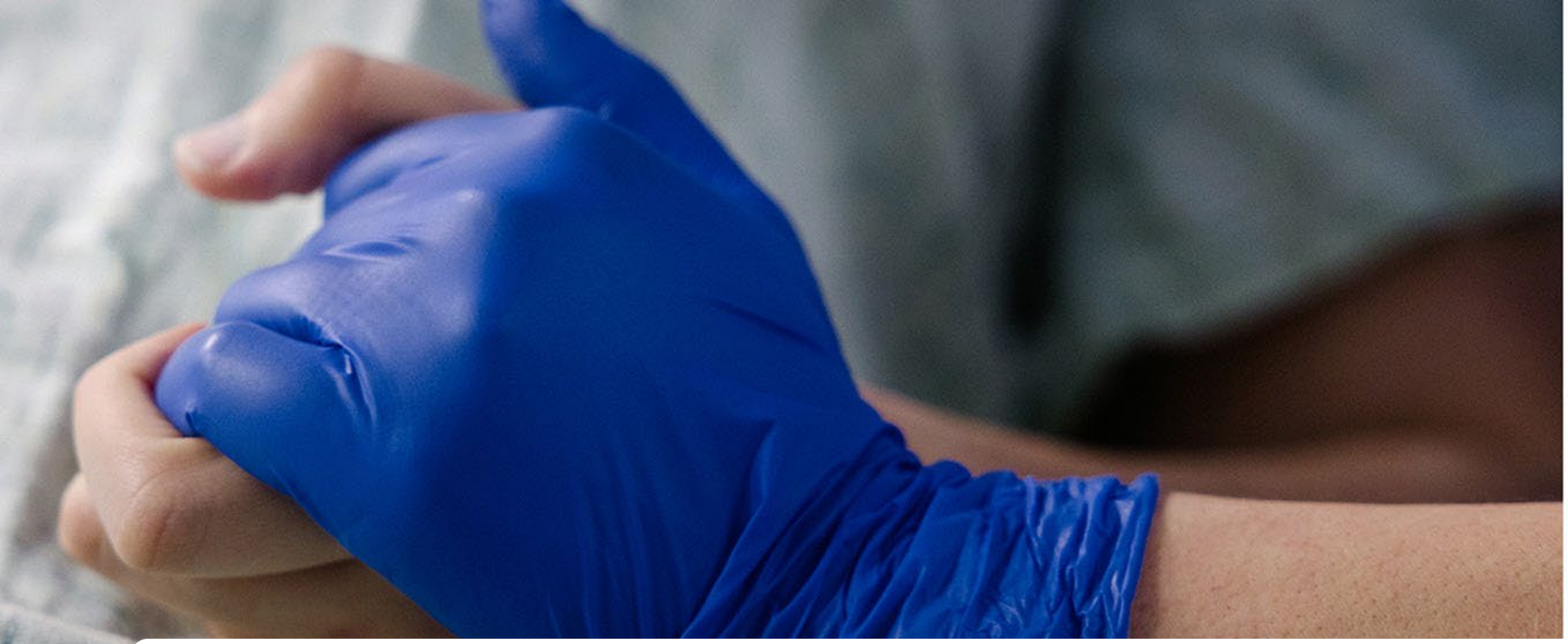
*High-risk: The provider must assess components such as medication management, physical assessment, social barriers, education needs, etc. to determine if a patient is high-risk.

Pharmacists should be included as part of the care team to help with medical management.

Discharge Planning for Home Care

Home care services can promote a quicker recovery and improve the quality of life for both the patient and their caregiver(s). Home care clinicians will teach the patient/caregiver regarding medications, diet, physical activity, signs/symptoms of exacerbations, and how to respond quickly to these symptoms. These clinicians assess cardiac function by checking vital signs, lung sounds, overall body system assessment, and by evaluating activity tolerance. By providing remote patient monitoring, home care services can decrease patients' and caregivers' anxiety, provide daily monitoring and rapid interventions, and reinforce patients' treatment plans.

Home care referral should be considered in patients with a new diagnosis of heart failure; patients with a current diagnosis of heart failure and multiple comorbid factors; and patients who have a history of frequent emergency room visits or hospitalizations. Patients requiring frequent medication adjustment or who require home IV diuresis or medication infusion often require services from a home care agency. Other candidates for in-home support are those who have quickly deconditioned and would benefit from skilled therapy to regain strength, mobility, and increased independence with activities of daily living.



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MANAGEMENT

Education
Palliative Care

Heart Failure Disease Management

Heart failure disease management is a nurse-driven program designed to provide patients with the knowledge and tools to understand and help control their disease.

Such visits focus on education surrounding lifestyle, diet, exercise, and medications with an emphasis on self-management.

This includes patient assessments of healthcare literacy, quality of life, and heart failure knowledge.

Care coordination amongst visiting nurses, caregivers, pharmacies, cardiac rehab, social workers, PCPs, and other medical specialties is an integral part of a successful heart failure disease management program.

Patient Education

A disease management visit can include education regarding the importance of:

- Daily weights, use of zone tracking sheet
- Understanding heart failure disease, treatment, and progression
- Medication doses, purpose, and potential side effects
- Medication compliance – Exercise in heart failure
- Low sodium diet
- Adhering to follow-up office visits
- Recognizing the signs and symptoms of worsening heart failure and when to call the office
- Restriction of free fluid intake
- Smoking Cessation
- Sobriety
- Flu, pneumococcal, and COVID-19 vaccination
- Learning about indications for an ICD
- When to plan for a family meeting, when to discuss hospice

The disease management team can also help to address financial barriers. Resources for prescription assistance programs include those for:

  - Entresto® (sacubitril/valsartan) - entrestohcp.com
  - Jardiance® (empagliflozin) - Boehringer-ingelheim.com
  - Faxiga® (dapagliflozin) https://www.farxiga.com/savings-support/hero

Community Health Resources

CONSIDERATION OF COMMUNITY HEALTH AND WELL-BEING (CHWB) RESOURCES

Trinity Health can offer many resources to CHF patients including transportation, education on diet, home modification, and access to programs and resources to address social needs such as financial concerns with the cost of medical care or prescription medications. In some instances, CHWB offers patient equipment such as a scale, blood pressure cuff, or pulse oximeter.

Palliative Care

Palliative Care in the Outpatient Setting

Any patient who was evaluated by the palliative care service during their inpatient admission should be seen by the palliative care service in the outpatient setting.

Advanced directives should be discussed and documented.

Palliative care resources may be consulted for symptom management and for identifying community resources.

Palliative Care in the Inpatient Setting

Candidates for in-patient palliative care consults include:

- Patients greater than 85 years old presenting with heart failure
- Patients undergoing advanced therapy workup or being evaluated for palliative inotropes.

Discharge Planning for Hospice

Patients who would benefit from a hospice referral are those patients who, if their disease runs its typical course, would be expected to have a life expectancy of 6 months or less. Other criteria to consider when considering a hospice referral include significant weight loss, a decline in cognitive abilities, lack of response to treatment with a worsening of symptoms, recent change to a Do Not Resuscitate (DNR) status, or a patient/family request for comfort care/measures.

Hospice provides many benefits including frequent nursing and aide visits, payment for medications that control symptoms and enhance comfort, and the provision of durable medical equipment. Hospice also provides volunteers to visit patients and to provide socialization and support. Hospice also utilizes social workers and chaplains to assist families with life planning, spiritual support for the patient and family, and grief counseling and follow-up bereavement services.

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Acronyms

CAD – coronary artery disease
GDMT – guideline-directed medical therapy
HF – heart failure
HFimpEF – heart failure with an improved ejection fraction
HFmrEF – heart failure with a mildly reduced ejection fraction
HFpEF – heart failure with a preserved ejection fraction
HFrEF – heart failure with a reduced ejection fraction
LVEF – Left ventricular ejection fraction
NICM – non-ischemic cardiomyopathy
RAS – Renal artery stenosis