



# **PQRS Measure # 228**

## **Heart Failure (HF): Left Ventricular Function (LVF) Testing**

### **NQF Endorsement Measure Submission Summary Materials**

#### **Submitted by:**

**Quality Insights of Pennsylvania**

**A special project for the Centers for Medicare & Medicaid Services (CMS) and the National Quality Forum**

***Confidential & Proprietary***



**Quality  
Insights**  
Pennsylvania

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## I. 2011 Physician Quality Reporting System Specification



### Measure #228: Heart Failure (HF): Left Ventricular Function (LVF) Testing

#### 2011 PHYSICIAN QUALITY REPORTING OPTIONS FOR INDIVIDUAL MEASURES:

##### REGISTRY ONLY

##### DESCRIPTION:

Percentage of patients with LVF testing during the current year for patients hospitalized with a principal diagnosis of HF during the measurement period

##### INSTRUCTIONS:

This measure is to be reported a minimum of once per reporting period for HF patients hospitalized with a principal diagnosis of HF during the reporting period. This measure is intended to reflect the quality of services provided for HF patients hospitalized with a principal diagnosis of HF during the measurement period. The measurement period includes 12-months back from the date of service or during the hospitalization. This measure may be reported by clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

##### Measure Reporting via Registry:

ICD-9-CM diagnosis codes, CPT codes, and patient demographics are used to identify patients who are included in the measure's denominator. The listed numerator options are used to report the numerator of the measure. The quality-data codes have been provided for registry only measures for use by registries that utilize claims data. It is not necessary to submit these codes for registry-based submissions. **Do not report this measure via claims.**

##### DENOMINATOR:

All patients with a principal diagnosis of HF  $\geq 18$  years of age hospitalized during the measurement period

Denominator Criteria (Eligible Cases): Patients aged  $\geq 18$  years on date of encounter

##### AND

Principal diagnosis for HF (ICD-9-CM): 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9

##### AND

Patient encounter during reporting period (CPT): 99221, 99222, 99223, 99231, 99232, 99233, 99238, 99239, 99291

**Continued 2011 Physician Quality Reporting System Specification****NUMERATOR:**

Patients with LVF testing during the measurement period

**Numerator Instructions:** May include documentation of order (written order, verbal order, or standing order/protocol) for LVF testing

**Numerator Options:**

Left ventricular function testing performed during the measurement period (G8682)

**OR**

Clinician documented that patient is not an eligible candidate for left ventricular function testing during the measurement period (G8683)

**OR**

Left ventricular function testing not performed during the measurement period, reason not specified (G8685)

**RATIONALE:**

Appropriate selection of medications to reduce morbidity and mortality in heart failure requires the identification of patients with impaired left ventricular systolic function. National guidelines advocate the evaluation of left ventricular systolic function as the single most important diagnostic test in the management of all patients with heart failure (Hunt, 2005). Despite these recommendations, left ventricular systolic function is not evaluated in a substantial proportion of eligible older patients hospitalized with heart failure (Jencks, 2000).

**CLINICAL RECOMMENDATION STATEMENTS:**

In patients with HF, an assessment of left ventricular systolic function with 2-dimensional echocardiography or radionuclide ventriculography is recommended. (Class 1 Recommendation, Level- C Evidence) (ACC/AHA)

In patients with a change in clinical status or clinical event/treatment with significant effect on cardiac function, repeat measurement of ejection fraction is recommended. (Level-C Evidence) (ACC/AHA)



## II. 2012 Physician Quality Reporting System Specification

### ♦ Measure #228: Heart Failure (HF): Left Ventricular Function (LVF) Testing

#### 2012 PHYSICIAN QUALITY REPORTING OPTIONS FOR INDIVIDUAL MEASURES: REGISTRY ONLY

##### DESCRIPTION:

Percentage of patients 18 years and older with LVF testing performed during the measurement period for patients hospitalized with a principal diagnosis of HF during the reporting period

##### INSTRUCTIONS:

This measure is to be reported a minimum of once per reporting period for HF patients hospitalized with a principal diagnosis of HF during the reporting period. This measure is intended to reflect the quality of services provided for HF patients hospitalized with a principal diagnosis of HF during the measurement period. The measurement period includes 12-months prior to the date of service or during the hospitalization. This measure may be reported by clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

##### **Measure Reporting via Registry:**

ICD-9-CM diagnosis codes, CPT codes, and patient demographics are used to identify patients who are included in the measure's denominator. The listed numerator options are used to report the numerator of the measure. The quality-data codes have been provided for registry only measures for use by registries that utilize claims data. It is not necessary to submit these codes for registry-based submissions. **Do not report this measure via claims.**

##### DENOMINATOR:

All patients aged 18 years and older with a principal diagnosis of HF hospitalized during the reporting period

**Denominator Criteria (Eligible Cases):** Patients aged  $\geq$  18 years on date of encounter

##### **AND**

**Principal diagnosis for HF (ICD-9-CM):** 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9

##### **AND**

**Patient encounter during reporting period (CPT):** 99221, 99222, 99223, 99231, 99232, 99233, 99238, 99239, 99291

**Continued 2012 Physician Quality Reporting System Specification****NUMERATOR:**

Patients with LVF testing performed during the measurement period

**Numerator Definition:**

**Not Eligible-** not eligible includes patient refusal of LVF testing or other documentation from clinician of reason not eligible.

**Numerator Options:**

Left ventricular function testing performed during the measurement period (G8682)

**OR**

Clinician documented that patient is not an eligible candidate for left ventricular function testing during the measurement period (G8683)

**OR**

Left ventricular function testing not performed during the measurement period, reason not specified (G8685)

**RATIONALE:**

Appropriate selection of medications to reduce morbidity and mortality in heart failure requires the identification of patients with impaired left ventricular systolic function. National guidelines advocate the evaluation of left ventricular systolic function as the single most important diagnostic test in the management of all patients with heart failure (Hunt, 2005). Despite these recommendations, left ventricular systolic function is not evaluated in a substantial proportion of eligible older patients hospitalized with heart failure (Jencks, 2000).

**CLINICAL RECOMMENDATION STATEMENTS:**

In patients with HF, an assessment of left ventricular systolic function with 2-dimensional echocardiography or radionuclide ventriculography is recommended. (Class 1 Recommendation, Level-C Evidence) (ACC/AHA)

In patients with a change in clinical status or clinical event/treatment with significant effect on cardiac function, repeat measurement of ejection fraction is recommended. (Level-C Evidence) (ACC/AHA)

### III. 2013 Physician Quality Reporting System Specification

#### ♠ Measure #228: Heart Failure (HF): Left Ventricular Function (LVF) Testing

#### 2013 PQRS OPTIONS FOR INDIVIDUAL MEASURES: REGISTRY ONLY

##### DESCRIPTION:

Percentage of patients 18 years and older with Left Ventricular Function (LVF) testing performed within the previous 12 months for patients who are hospitalized with a principal diagnosis of Heart Failure (HF) during the reporting period

##### INSTRUCTIONS:

This measure is to be reported a minimum of once per reporting period for patients hospitalized with a principal diagnosis of HF during the reporting period. This measure is intended to reflect the quality of services provided for patients hospitalized with a principal diagnosis of HF during hospitalization or within the previous 12 months. This measure may be reported by clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

##### Measure Reporting via Registry:

ICD-9-CM diagnosis codes, CPT codes, and patient demographics are used to identify patients who are included in the measure's denominator. The listed numerator options are used to report the numerator of the measure.

The quality-data codes listed do not need to be submitted for registry-based submissions; however, these codes may be submitted for those registries that utilize claims data.

##### DENOMINATOR:

All patients aged 18 years and older hospitalized with a principal diagnosis of HF during the reporting period

##### Denominator Criteria (Eligible Cases):

Patients aged  $\geq 18$  years on date of encounter

##### AND

**Principal diagnosis for HF (ICD-9-CM):** 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9

**Principal diagnosis for HF (ICD-10-CM) [REFERENCE ONLY/Not Reportable]:** I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.32, I50.33, I50.40, I50.41, I50.42, I50.43, I50.9

##### AND

**Patient encounter during reporting period (CPT):** 99221, 99222, 99223, 99231, 99232, 99233, 99238, 99239, 99291

## Continued 2013 Physician Quality Reporting System Specification

### NUMERATOR:

Patients with LVF testing performed during the measurement period

#### **Definitions:**

**Left ventricular function (LVF) testing** - Assessment of the hearts function to determine the stroke volume (SV), the end-diastolic volume (EDV), and the ejection fraction (EF)

**Stroke volume (SV)** - The amount of blood in the heart that exits the ventricles with each beat.

**End-diastolic volume (EDV)** - The total amount of blood in the ventricles at the end of diastole

**Ejection fraction (EF)** - The proportion of the volume of blood in the ventricles at the end of diastole that is ejected during systole. EF is expressed as a percentage and is calculated by dividing the (SV) by the (EDV)

**Not Eligible** - A patient is not eligible if one or more of the following reasons exist:

- Patient refuses LVF testing
- Other reason documented by the eligible professional the patient is not eligible for LVF testing

#### Numerator Options:

LVF testing performed during the measurement period (G8682)

OR

LVF testing not performed for a documented reason (G8683)

OR

LVF testing is not performed, reason not given (G8685)

### RATIONALE:

Evaluation of LVF in HF patients provides important information required to direct appropriate treatment. (Bonow et al. 2012) National guidelines advocate the evaluation of left ventricular systolic function as the single most important diagnostic test in the management of all patients with HF. (Jessup et al., 2009)

### CLINICAL RECOMMENDATION STATEMENTS:

Two-dimensional echocardiography with Doppler should be performed during initial evaluation of patients presenting with HF to assess LVF, left ventricular size, wall thickness, and valve function. Radionuclide ventriculography can be performed to assess LVF and volumes. (Jessup et al. 2009; Lindenfeld et al. 2010) (Class I Recommendation, Level of Evidence: C) (ACC/AHA/HFSA)

Repeat measurement of EF and the severity of structural remodeling can be useful to provide information in patients with HF who have had a change in clinical status or who have experienced or recovered from a clinical event or received treatment that might have had a significant effect on cardiac function. (Jessup et al. 2009; Lindenfeld et al. 2010) (Class IIa Recommendation, Level of Evidence: C) (ACC/AHA/HFSA)



## IV. 2014 Physician Quality Reporting System Specification

### Measure #228: Heart Failure (HF): Left Ventricular Function (LVF) Testing

#### 2014 PQRS OPTIONS FOR INDIVIDUAL MEASURES: REGISTRY ONLY

##### DESCRIPTION:

Percentage of patients 18 years and older with Left Ventricular Function (LVF) testing documented as being performed within the previous 12 months or LVF testing performed prior to discharge for patients who are hospitalized with a principal diagnosis of Heart Failure (HF) during the reporting period

Please note that patients may have either a diagnosis of heart failure with reduced or preserved systolic function (ejection fraction).

##### INSTRUCTIONS:

This measure is to be reported a minimum of once per reporting period for patients hospitalized with a principal diagnosis of HF during the reporting period. This measure is intended to reflect the quality of services provided for patients hospitalized with a principal diagnosis of HF during hospitalization or within the previous 12 months. This measure may be reported by clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

##### Measure Reporting via Registry:

ICD-9-CM/ICD-10-CM diagnosis codes, CPT codes, and patient demographics are used to identify patients who are included in the measure's denominator. The listed numerator options are used to report the numerator of the measure.

The quality-data codes listed do not need to be submitted for registry-based submissions; however, these codes may be submitted for those registries that utilize claims data.

##### DENOMINATOR:

All patients aged 18 years and older and hospitalized with a principal discharge diagnosis of HF during the reporting period

Denominator Criteria (Eligible Cases): Patients aged  $\geq 18$  years on date of encounter **AND**

Principal diagnosis for HF (ICD-9-CM) [for use 1/1/2014-9/30/2014]: 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9

Principal diagnosis for HF (ICD-10-CM) [for use 10/01/2014-12/31/2014]: I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.32, I50.33, I50.40, I50.41, I50.42, I50.43, I50.9

##### AND

Patient encounter during reporting period (CPT): 99221, 99222, 99223, 99231, 99232, 99233, 99238, 99239, 99291

**Continued 2014 Physician Quality Reporting System Specification****NUMERATOR:**

Patients with LVF testing documented as being performed either prior to discharge or in the previous 12 months

**Definitions:**

**Left ventricular function (LVF) testing** - Assessment of heart function by Left Ventricular Function (LVF) Testing including but not limited to: Echocardiography, Transoesophageal Echocardiography, Doppler Echocardiography, Stress Echocardiography, Cardiac Magnetic Resonance Tomography, Single-Photon Emission Computed Tomography (SPECT), Radionuclide Ventriculography (Gated SPECT), Positron Emission Tomography Imaging (PET), Computed Tomography (CT), and/or Coronary Angiography with Ventriculogram.

**PLEASE NOTE:** Echocardiography is the recommended test of choice for evaluation of LV function.

**Not Eligible** - A patient is not eligible if one or more of the following reasons are documented:

- Patient refuses LVF testing
- Other reason documented by the eligible professional the patient is not eligible for LVF testing
- Patients who had a left ventricular assistive device (LVAD) or heart transplant procedure during hospital stay
- Patients who have a Length of stay greater than 120 days
- Patients enrolled in clinical trials
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for palliative care
- Patients discharged to a health care facility for palliative care

**Numerator Options:**

LVF testing performed or documented as being performed prior to discharge or in the previous 12 months (**G8682**)

**OR**

LVF testing not performed prior to discharge or in the previous 12 months for a documented medical or patient reason (**G8683**)

**OR**

LVF testing not documented as being performed in the previous 12 months, reason not given (**G8685**)

## Continued 2014 Physician Quality Reporting System Specification

### RATIONALE:

Evaluation of LVF in HF patients provides important clinical information required to diagnose, monitor and direct appropriate treatment (Bonow et al. (2012); McKelvie et al. (2013); McMurray et al. (2012)). National guidelines advocate the evaluation of left ventricular systolic function as the single most important diagnostic test in the management of all patients with HF (McMurray et al. (2012); McKelvie et al. (2013)).

Heart failure (HF) is associated with impaired ventricular function, either reduced or preserved systolic function (ejection fraction). Treatment to reduce morbidity and mortality requires evaluation to determine the extent of impairment, through ventricular function testing (Bonow et al. (2012); McKelvie et al. (2013); McMurray et al. (2012)).

Echocardiography has been recognized as the gold standard for LVF evaluation (McMurray et al. (2012) Ananthasubramaniam, (2011); Penicka, (2010)).

The pathophysiology of HF is diverse and many patients remain asymptomatic despite significant dysfunction. Impaired ventricular function, however, is a definitive characteristic of heart failure and the cornerstone of evaluation when HF is suspected (McKelvie et al. (2013); McMurray et al.(2012)).

### CLINICAL RECOMMENDATION STATEMENTS:

Echocardiography is the recommended left ventricular function evaluation test of choice due to reasons of accuracy, availability, safety and cost (McKelvie et al., 2013; McMurray et al., 2012). Two-dimensional echocardiography with Doppler should be performed during initial evaluation of patients presenting with HF to assess LVF, left ventricular size, wall thickness, and valve function. Radionuclide ventriculography can be performed to assess LVF and volumes (McKelvie et al., 2013; McMurray et al., 2012, Jessup et al., 2009 & Lindenfeld et al., 2010).

Repeat measurement of EF and the severity of structural remodeling can be useful to provide information in patients with HF who have had a change in clinical status or who have experienced or recovered from a clinical event or received treatment that might have had a significant effect on cardiac function (McKelvie et al. (2013); Jessup et al., 2009; Lindenfeld et al., 2010).

An echocardiogram to confirm the diagnosis of heart failure and/or cardiac dysfunction is mandatory and should be performed shortly following suspicion of the diagnosis of HF (McKelvie et al., 2013; McMurray et al., 2012).

## V. INTRODUCTION

The Centers of Medicare and Medicaid Services (CMS) is the Steward seeking initial endorsement. Quality Insights of Pennsylvania is submitting the measure for endorsement.

The purpose of this document is to provide additional information about the measure seeking initial National Quality Forum endorsement. PQRS Measure # 228 Heart failure (HF): Left Ventricular Function (LVF) Testing was first introduced in 2011. It is a Registry only measure.

Measure testing was performed for the first time with data received from Registry claims for eligible providers from the years 2011 and 2012. Limited data was available for this measure. Yet testing analysis was performed by Quality Insights of Pennsylvania And reported in National Quality Forum's (NQF) Measure Testing form (sub criteria 2a2, 2b2-2b6).

## VI. MEASURE PERFORMANCE CALCULATION

Quality Insights requested an ad hoc data request for registry claims data to perform reliability testing for this measure. The complete findings are in the above referenced NQF Testing form.

### a. Brief Description of Data

Time Period: 1/1/2011 – 12/31/2011

1/1/2012 – 12/31/2012

### b. Performance Calculation:

For performance purposes, this measure is calculated by creating a fraction with the following components: Numerator, Performance Denominator and Denominator Exclusions.

Numerator (A) Includes: Number of patients meeting numerator criteria

Performance Denominator (PD) Includes: Number of patients meeting criteria for denominator inclusion

Denominator Exclusions (B) Include: Number of patients with valid denominator exclusions

## Continued Measure Performance Calculation

The method of performance calculation is determined by the following:

1. Identify the patients who meet the eligibility criteria for the denominator (PD) which includes patients who are 18 years and older on date of encounter

**AND**

Principal diagnosis for HF (ICD-9-CM): 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9

Principal diagnosis for HF (ICD-10-CM) [REFERENCE ONLY/Not Reportable]: I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.32, I50.33, I50.40, I50.41, I50.42, I50.43 and I50.9

**AND**

Patient encounter during reporting period (CPT® codes): 99221, 99222, 99223, 99231, 99232, 99233, 99238, 99239 and 99291

2. Identify which of those patients meet the numerator criteria (G8682, G8685) (A); and
3. For those patients who do not meet the numerator criteria, determine whether an appropriate exclusion applies (G8683) (B) and subtract those patients from the denominator.

Numerator (A)

-----  
Performance Denominator (PD) - Denominator Exclusions (B)

Exclusion Calculation – The percentage of Denominator Valid (PD) patients with Denominator Exclusions (B) as calculated by the following:

Denominator Exclusions (B)

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Performance Denominator (PD)



## VII. CALCULATION FOR PERFORMANCE ALGORITHM

The measure performance is calculated by creating a fraction with the following components: Numerator (A), Total Denominator Population (TDP), and Denominator Exclusions (B).

**Numerator (A) Includes:** Number of patients meeting numerator criteria

**Total Denominator Population (TDP) Includes:** Number of patients meeting criteria for denominator inclusion as defined in the denominator details

**Denominator Exclusions (B) Include:** Number of patients with valid exclusions (where applicable; will differ by measure)

**Performance Denominator (PD) Includes:** Number of patients meeting criteria for denominator inclusion without valid denominator exclusions

### Numerator (A) Calculation

A (# of patients meeting numerator criteria)

### Denominator Exclusion Calculation

B (# patients with valid denominator exclusions)

TDP (# patients in denominator)

### Performance Calculation

A (# of patients meeting numerator criteria)

TDP (# patients in denominator) – B (# patients with valid denominator exclusions)

## VIII. DESCRIPTION OF REPORTING G CODES

2013 SPECIFICATION CODING			
Code	Type	N/D/E	G-Code Numerator Code Description
G8682	HCPCS	N	LVF testing performed during the measurement period
G8683	HCPCS	N	LVF testing not performed for a documented reason
G8685	HCPCS	N	LVF testing is not performed, reason not given

## IX. DENOMINATOR VALUE SETS

2013 SPECIFICATION CODING				
Code	Type	N/D/E	ICD-9 Denominator Code Description	ICD-10 Conversion Code
402.01	ICD-9	D	Hypertensive heart disease; malignant; with heart failure	I11.0
402.11	ICD-9	D	Hypertensive heart disease; benign; with heart failure	I11.0
402.91	ICD-9	D	Hypertensive heart disease; unspecified; with heart failure	I11.0
404.01	ICD-9	D	Hypertensive heart and chronic kidney disease; malignant; with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	I13.0
404.03	ICD-9	D	Hypertensive heart and chronic kidney disease; malignant; with heart failure and chronic kidney disease stage V or end stage renal disease	I13.2
404.11	ICD-9	D	Hypertensive heart and chronic kidney disease; benign; with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	I13.0
404.13	ICD-9	D	Hypertensive heart and chronic kidney disease; benign; with heart failure and chronic kidney disease stage V or end stage renal disease	I13.2
404.91	ICD-9	D	Hypertensive heart and chronic kidney disease; unspecified; with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	I13.0
404.93	ICD-9	D	Hypertensive heart and chronic kidney disease; unspecified; with heart failure and chronic kidney disease stage V or end stage renal disease	I13.2
428.21	ICD-9	D	Systolic heart failure; acute on chronic	I50.21
428.22	ICD-9	D	Systolic heart failure; chronic	I50.22
428.23	ICD-9	D	Systolic heart failure; acute on chronic	I50.23
428.30	ICD-9	D	Diastolic heart failure; unspecified	I50.30
428.31	ICD-9	D	Diastolic heart failure; acute	I50.31
428.32	ICD-9	D	Diastolic heart failure; chronic	I50.32

2013 SPECIFICATION CODING				
Code	Type	N/D /E	ICD-9 Denominator Code Description	ICD-10 Conversion Code
428.33	ICD-9	D	Diastolic heart failure; acute on chronic	I50.33
428.40	ICD-9	D	Combined systolic and diastolic heart failure; unspecified	I50.40
428.41	ICD-9	D	Combined systolic and diastolic heart failure; acute	I50.41
428.42	ICD-9	D	Combined systolic and diastolic heart failure; chronic	I50.42
428.43	ICD-9	D	Combined systolic and diastolic heart failure; acute on chronic	I50.43
428.9	ICD-9	D	Heart failure, unspecified	I50.9
Code	Code Type	N/D /E	ICD-10 Denominator Code Description	ICD-9 Conversion Code
I11.0	ICD-10	D	Hypertensive heart disease with (congestive) heart failure Inc: Hypertensive heart failure	402.01 402.11 402.91
I13.0	ICD-10	D	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease	404.01 404.11 404.91
I13.2	ICD-10	D	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease	404.03 404.13 404.93
I50.1	ICD-10	D	Left ventricular failure	428.0 428.9
I50.20	ICD-10	D	Unspecified systolic (congestive) heart failure	428.0 428.20
I50.21	ICD-10	D	Acute systolic (congestive) heart failure	428.0 428.21
I50.22	ICD-10	D	Chronic systolic (congestive) heart failure	428.0 428.22
I50.23	ICD-10	D	Acute on chronic systolic (congestive) heart failure	428.0 428.23
I50.30	ICD-10	D	Unspecified diastolic (congestive) heart failure	428.0 428.30
I50.31	ICD-10	D	Acute diastolic (congestive) heart failure	428.0 428.31
I50.32	ICD-10	D	Chronic diastolic (congestive) heart failure	428.0 428.32
I50.33	ICD-10	D	Acute on chronic diastolic (congestive) heart failure	428.0 428.33
I50.40	ICD-10	D	Unspecified combined systolic (congestive) and diastolic (congestive) heart failure	428.0 428.40
I50.41	ICD-10	D	Acute combined systolic (congestive) and diastolic (congestive) heart failure	428.0 428.41
I50.42	ICD-10	D	Chronic combined systolic (congestive) and diastolic (congestive) heart failure	428.0 428.42
I50.43	ICD-10	D	Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure	428.0 428.43
I50.9	ICD-10	D	Heart failure, unspecified	428.0 428.9

## X. REFERENCES

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