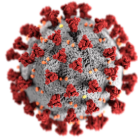


EVENT DEFINITION FORM

Event: Heart Failure
Outcome/covariate: **outcome**
Version: 1.0
Status: Final

Contributing authors

authors	Role	Date
Ilse Kelters (UMCU)	Medical/drafting v0.1	June 24, 2020
Miriam Sturkenboom	Epidemiological/review	June 28, 2020
Ilse Kelters	Add codes	July 17, 2020
Miriam Sturkenboom	Code review	August 13, 2020
Leila Belbachir	Medical review	August 23, 2020
Miriam, Roos, Leila	Code update	August 25, 2020
Corinne Willame	Concept set proposal	September 02, 2020
Miriam Sturkenboom	update code list	March 23, 2021
Carlos Durán	Rev. narrow/possible assignment	March 29, 2021
Review ACCESS consortium		
Miriam Sturkenboom	Inclusion of code list used for final report	August 20, 2021



1. Event definition

(Chronic) heart failure

HF is a clinical syndrome characterized by typical symptoms (e.g. breathlessness, ankle swelling and fatigue) that may be accompanied by signs (e.g. elevated jugular venous pressure, pulmonary crackles and peripheral oedema) caused by a structural and/or functional cardiac abnormality, resulting in a reduced cardiac output and/or elevated intracardiac pressures at rest or during stress. The current definition of HF restricts itself to stages at which clinical symptoms are apparent (Ponikowski, et al.).

HF comprises a wide range of presentations, from patients with normal LVEF [typically considered as $\geq 50\%$; HF with preserved EF (HFpEF)] to those with reduced LVEF [typically considered as $< 40\%$; HF with reduced EF (HFrEF)] (Table 3.1). Patients with an LVEF in the range of 40–49% represent a ‘grey area’, which is defined as HFmrEF. Differentiation of patients with HF based on LVEF is important due to different underlying aetiologies, demographics, co-morbidities and response to therapies.⁶ Most clinical trials published after 1990 selected patients based on LVEF [usually measured using echocardiography, a radionuclide technique or cardiac magnetic resonance (CMR)], and it is only in patients with HFrEF that therapies have been shown to reduce both morbidity and mortality.

Case definition of HF

- (In all cases) Presence of symptoms and/or signs of HF¹

AND

- A LVEF $< 40\%$ ²

OR

- A ‘preserved’ LVEF² (defined as LVEF $\geq 50\%$ for HFpEF or 40–49% for HFmrEF); and
- Elevated levels of NPs (BNP > 35 pg/mL and/or NT-proBNP > 125 pg/mL); and
- Objective evidence of other cardiac functional³ and structural alterations⁴ underlying HF

1

Symptoms and signs typical of heart failure

²Assessment of LVEF by echocardiography, the modified biplane Simpson’s rule is recommended

³Assessment of functional alterations by cardiac imaging and other diagnostic tests (e.g. echocardiography (see table 4.3), ECG)

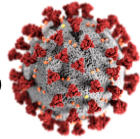
⁴Left ventricular hypertrophy and/or left atrial enlargement

Cohort studies initiated before 2016 have generally used the Framingham criteria on heart failure (McKee et al.), for example the EAHFE Registry (Javaloyes et al.).

Acute heart failure (AHF)

AHF refers to rapid onset or worsening of symptoms and/or signs of HF. It can present as a first occurrence (de novo) or, more frequently, as a consequence of acute decompensation of chronic HF, and may be caused by primary cardiac dysfunction. Acute myocardial dysfunction (ischaemic, inflammatory or toxic), acute valve insufficiency or pericardial tamponade are among the most frequent acute primary cardiac causes of AHF.

There is no universal event definition for AHF. The European society of cardiology classifies AHF syndromes based on clinical presentation (Figure 12.1). This combine clinical classification identifies



four groups of patients that allow initial stratification as guide to therapy and prognosis (Ponikowski et al.). Previous guidelines classified AHF based on aetiologies (table 1; extracted from Nieminen et al.).

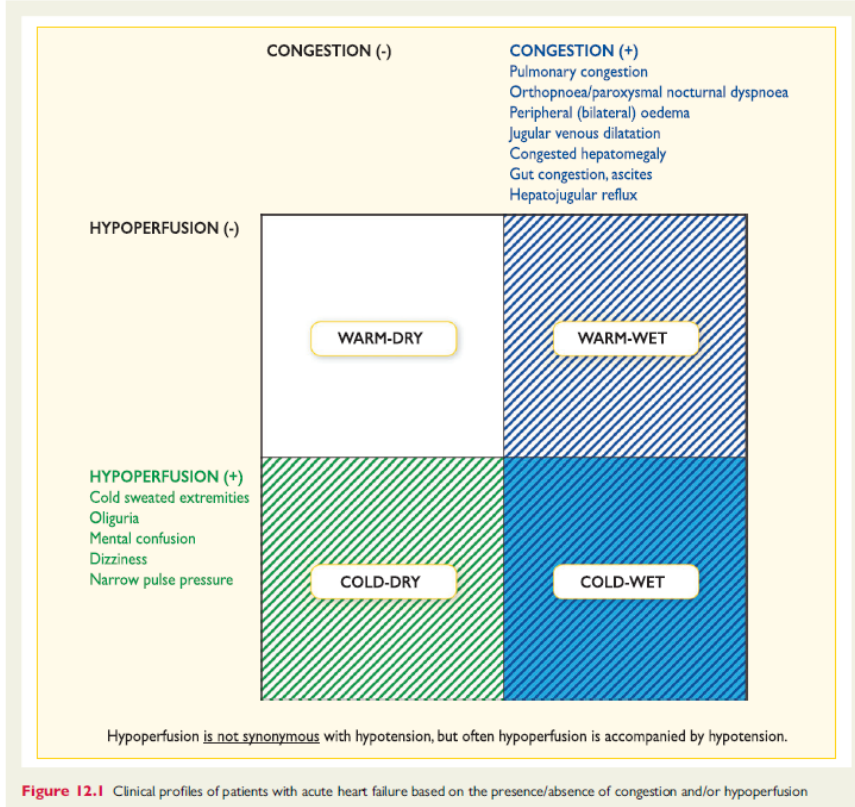
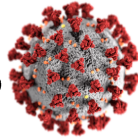


Table 1 Profile of patients (from: Nieminen et al.)

<p>Acute de novo or chronic decompensated HF</p> <ul style="list-style-type: none"> • Acute decompensated HF (de novo or as decompensation of chronic HF): signs and symptoms of acute HF develop over days and are mild. They do not fulfil the criteria for cardiogenic shock, pulmonary edema, or hypertensive crisis (normal blood pressure, jugular venous distension, and peripheral edema). The ejection fraction is reduced. • Hypertensive acute HF: signs and symptoms of HF develop abruptly and are accompanied by high blood pressure and relatively preserved left ventricular function with a chest radiograph compatible with acute pulmonary edema. • Pulmonary edema (verified by chest x-ray) accompanied by severe respiratory distress, with crackles over the lung and orthopnea, with O₂ saturation usually —90% on room air before treatment. • Cardiogenic shock: cardiogenic shock is defined as evidence of tissue hypoperfusion induced by HF after correction of preload. There is no clear definition for hemodynamic parameters, but cardiogenic shock is usually characterized by reduced blood pressure (systolic blood pressure <90 mm Hg or a drop of mean arterial pressure >30 mm Hg) and/or low urine output (<0.5 ml/kg/h), with a pulse rate >60 beats/min with or without evidence of organ congestion. There is a continuum from low cardiac output syndrome to cardiogenic shock. • High output failure is characterized by high cardiac output, usually with high heart rate (caused by arrhythmias, thyrotoxicosis, anemia, Paget disease, or iatrogenic or other mechanisms), with warm peripheries, pulmonary congestion, and sometime- low blood pressure, as in septic shock.
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- Right HF is characterized by low-output syndrome with increased jugular venous pressure, increased liver size, and hypotension.

The ESC-EORP HFA Heart Failure Long-term Registry, which is the largest pan-European cohort, defined the following diagnosis criteria according to the ESC 2016 Guidelines (Ponikowski et al.): “A diagnosis of AHF was made by the clinician-investigators at initial presentation and required the presence of signs and symptoms of HF, evidence of cardiac dysfunction, and the need for therapy” (Chioncel et al.). In this study the patients were retrospectively classified into the four profiles according to the 2016 ESC guidelines (figure 12.1)

Xanthopoulos et al. (2019) proposes a new terminology and therefore another classification of AHF, based on the different pathophysiology underlying in AHF. They distinguish acutely decompensated chronic HF (ADCHF) defined as the deterioration of preexisting CHF and de novo AHF defined as the rapid development of new symptoms and signs of HF that requires urgent medical attention (Xanthopoulos et al., Ponikowski et al.).

Chapman et al. (2019) has listed and compared the different clinical profiles at admission for acute heart failure.

2. Synonyms / lay terms for the event

Acute heart failure syndrome
 Congestive heart failure
 Congestive cardiac failure
 Left ventricular dysfunction
 Heart dysfunction
 Diseased myocardium
 Abnormal loading condition
 Structural myocardial defect
 Endomyocardial pathology
 Heart failure
 Decompensated chronic heart failure
 Congestion
 Decompensatio cordis

3. Laboratory tests that are specific for event

Chronic HF

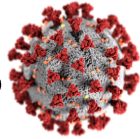
For diagnosis:

- Natriuretic peptides
 - o NT-proBNP \geq 125 pg/mL
 - o BNP \geq 35 pg/mL

For initial assessment

- Haemoglobin and WBC
- Sodium, potassium, urea, creatinine (with estimated GFR)
- Liver function tests (bilirubin, AST, ALT, GGTP)
- Glucose, HbA1c

Heart failure



- Lipid profile
- TSH
- Ferritin, TSAT = TIBC
- Natriuretic peptides

Acute HF

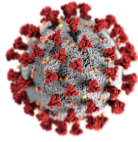
- Natriuretic peptides
 - o NT-proBNP (threshold: <300 pg/mL)
 - o BNP (threshold: <100pg/mL)
 - o MR-proANP (threshold <120pg/mL)
- Cardiac troponin
- Blood urea nitrogen or urea
- Creatinine
- Elektrolytes (sodium, potassium)
- Liver function tests (bilirubin, AST, ALT, GGTP)
- Thyroid function (TSH)
- Glucose
- Complete blood count
- D-dimer

4. Diagnostic tests that are specific for event

Chronic HF

1. 12-Lead ECG
In order to determine heart rhythm, heart rate, QRS morphology, and QRS durations, and to detect other relevant abnormalities.
2. Exercise testing
3. Chest radiography (X-ray)
To detect/exclude alternative pulmonary or other diseases, which may contribute to dyspnoea
4. Right heart catheterization
Done with a pulmonary artery catheter for mechanical circulatory support, to confirm pulmonary hypertension, or evaluation for heart transplantation.
5. Endomyocardial biopsy
In patients with rapidly progressive HF despite standard therapy, to evaluate if a specific diagnosis with an available and effective therapy is present.
6. Thoracic ultrasound
For conformation of pulmonary congestion and pleural effusion in patients with acute heart failure.
7. Ultrasound
For diagnosis and/or aetiology of HF.

Heart failure



8. Genetic testing

There is no confirmatory role of routine genetic testing to establish the diagnosis. Genetic counselling is recommended in patients with HCM, idiopathic DCM, and ARVC.

Acute HF

1. Chest X-ray

Chest X-ray can be useful test for diagnosis of AHF. Pulmonary venous congestion, pleural effusion, interstitial or alveolar oedema and cardiomegaly are the most specific findings for AHF, although in up to 20% of patients with AHF, chest X-ray is nearly normal (ref 519 guideline ESC). X-ray is also useful to exclude non-cardiac diseases.

2. 12-lead ECG

ECG is helpful to identify underlying cardiac disease.

3. Echocardiography

4. Monitoring of the haemodynamic status: transcutaneous arterial oxygen saturation, blood pressure, urine output, ECG, heart rate, heart rhythm, respiratory rate.

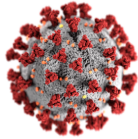
5. Drugs that are used to treat event

Chronic HF/long term

- Angiotensin-converting enzyme inhibitors (or angiotensin receptor blockers if ACEI is not tolerated/contraindicated)
- Beta-blockers
- Diuretics
 - o Mineralocorticoid/aldosterone receptor antagonists: spironolactone and epleronone
 - o Thiazides: bendroflumethiazide, hydrochlorothiazide, metolazone, indapamide
 - o Loop diuretics: furosemide, bumetanide, torasemide
- Angiotensin receptor neprilysin inhibitor
- Ivabradine
- Digoxin and other digitalis glycosides
- Hydralazine and isosorbide nitrate

Acute HF/Short term

- Circulatory support: Oxygen, non-invasive positive pressure ventilation, mechanic ventilation, fluids.
- Nitrate vasodilators: isosorbide dinitrate; nitroglycerin
- Inotropic agents: dobutamine, dopamine, levosimendan, phosphodiesterase III inhibitor
- Diuretics
- In case of cardiogenic shock: vasopressors e.g. norepinephrine
- In case of atrial fibrillation: digoxin, beta-blockers, amiodarone



6. Procedures used specific for event treatment

Chronic HF

1. Implantable cardioverter-defibrillator
2. Ventricular assist devices: mechanical circulatory support (LVAD, BIVAD)
3. Heart transplantation

Acute HF

1. Cardioversion or temporary pacing.
2. Renal replacement therapy. Recommended in patients who fail to respond to diuretic strategies.
3. Intra-aortic balloon pump. Recommended in patient having specific mechanical problems (e.g. interventricular septal rupture)
4. Ventricular assist devices: mechanical circulatory support (LVAD, BIVAD, ECMO, ECLS)

7. Setting (outpatient specialist, in-hospital, GP, emergency room) where condition will be most frequently /reliably diagnosed

Chronic: outpatient specialist

Acute: pre-hospital continued in the emergency department.

8. Diagnosis codes or algorithms used in different papers to extract the events in Europe/USA:

Note to self: Some studies (e.g. The RICA Study (Huerta-Preciado et al.)) excluded HF secondary to pulmonary hypertension. This also complies with COPD, chronic kidney disease,

ICD-10

I50.x Heart Failure

I11.0 Hypertensive heart disease with (congestive) heart failure

I13.0 Hypertensive heart and renal disease with (congestive) heart failure

I13.2 Hypertensive heart and renal disease with both (congestive) heart failure and renal failure,

ICD-9

428.xx Heart Failure

398.91 Rheumatic heart failure

402.01 Hypertensive heart disease, malignant, with heart failure

402.11 Hypertensive heart disease, benign, with heart failure

402.91 Hypertensive heart disease, unspecified, with heart failure

404.01 Hypertensive heart and chronic kidney disease, malignant, with heart failure

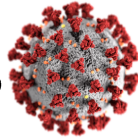
404.03 Hypertensive heart and chronic kidney disease, malignant, with heart failure and chronic kidney disease

404.11 Hypertensive heart and chronic kidney disease, benign, with heart failure

404.13 Hypertensive heart and chronic kidney disease, benign, with heart failure and chronic kidney disease

404.91 Hypertensive heart and chronic kidney disease, unspecified, with heart failure

Heart failure

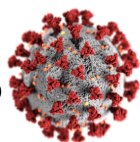


404.93 Hypertensive heart and chronic kidney disease, unspecified, with heart failure and chronic kidney disease

ICPC code: K77 Heart failure

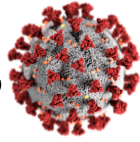
SAFEGUARD CPRD codes (READ)

READCODE	DESCRIPTION
SP11111	Heart failure as a complication of care
101..00	Heart failure confirmed
8H2S.00	Admit heart failure emergency
G210100	Malignant hypertensive heart disease with CCF
G21z100	Hypertensive heart disease NOS with CCF
G232.00	Hypertensive heart&renal dis wth (congestive) heart failure
G58..00	Heart failure
G58..11	Cardiac failure
G580.00	Congestive heart failure
G580.11	Congestive cardiac failure
G580.12	Right heart failure
G580.13	Right ventricular failure
G580.14	Biventricular failure
G580000	Acute congestive heart failure
G580100	Chronic congestive heart failure
G580200	Decompensated cardiac failure
G580300	Compensated cardiac failure
G580400	Congestive heart failure due to valvular disease
G581.00	Left ventricular failure
G581.11	Asthma - cardiac
G581.12	Pulmonary oedema - acute
G581000	Acute left ventricular failure
G582.00	Acute heart failure
G58z.00	Heart failure NOS
G58z.12	Cardiac failure NOS
R2y1000	[D]Cardiorespiratory failure
SP11100	Cardiac insufficiency as a complication of care
SP11200	Cardiorespiratory failure as a complication of care
33BA.00	Impaired left ventricular function
585f.00	Echocardiogram shows left ventricular systolic dysfunction
585g.00	Echocardiogram shows left ventricular diastolic dysfunction
G5yy900	Left ventricular systolic dysfunction
G5yyA00	Left ventricular diastolic dysfunction

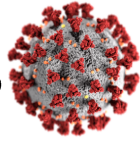


9. Codes used in ACCESS

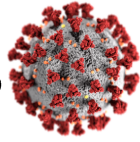
Coding system	Code	Code name	Concept	Concept name	Algorithm
ICD10/CM	I31.4	Cardiac tamponade	C0007177	Cardiac Tamponade	Narrow
ICD10/CM	I50	Heart failure	C0018801	Heart failure	Narrow
ICD10/CM	I50.9	Heart failure, unspecified	C0018801	Heart failure	Narrow
ICD10/CM	I50.9	Heart failure, unspecified	C0018801	Heart failure	Narrow
ICD10/CM	I50.1	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
ICD10/CM	I50.1	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
ICD10/CM	I50.1	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
ICD10/CM	I50.1	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
ICD10/CM	J81	Pulmonary oedema	C0034063	Pulmonary Edema	Possible
ICD10/CM	J81.1	Pulmonary edema NOS	C0034063	Pulmonary Edema	Possible
ICD10/CM	J80	Adult respiratory distress syndrome	C0035222	Respiratory Distress Syndrome, Adult	Possible
ICD10/CM	I09.81	Rheumatic heart failure	C0155582	Congestive rheumatic heart failure	Narrow
ICD10/CM	I09.81	Rheumatic heart failure	C0155582	Congestive rheumatic heart failure	Narrow
ICD10/CM	I26.09	Acute cor pulmonale NOS	C0155672	Acute cor pulmonale	Possible
ICD10/CM	J81.0	Acute pulmonary edema	C0155919	Acute pulmonary edema	Possible
ICD10/CM	J81.0	Acute pulmonary edema	C0155919	Acute pulmonary edema	Possible
ICD10/CM	I50.81	Right heart failure	C0235527	Heart Failure, Right-Sided	Narrow
ICD10/CM	I11.0	Hypertensive heart disease with (congestive) heart failure	C0264650	Hypertensive heart disease with congestive heart failure	Narrow
ICD10/CM	I11.0	Hypertensive heart failure	C0264652	Hypertensive heart failure	Narrow
ICD10/CM	P29.0	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow
ICD10/CM	P29.0	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow
ICD10/CM	I13.0	Hypertensive heart and renal disease with (congestive) heart failure	C0494575	Hypertensive heart and renal disease with (congestive) heart failure	Narrow
ICD10/CM	I50.82	Biventricular heart failure	C0685095	Biventricular congestive heart failure	Narrow
ICD10/CM	I50.82	Biventricular heart failure	C0685095	Biventricular congestive heart failure	Narrow
ICD10/CM	I50.20	Unspecified systolic (congestive) heart failure	C1135191	Heart Failure, Systolic	Narrow
ICD10/CM	I50.20	Unspecified systolic (congestive) heart failure	C1135191	Heart Failure, Systolic	Narrow
ICD10/CM	I50.30	Unspecified diastolic (congestive) heart failure	C1135196	Heart Failure, Diastolic	Narrow
ICD10/CM	I50.30	Unspecified diastolic (congestive) heart failure	C1135196	Heart Failure, Diastolic	Narrow
ICD10/CM	I11.0	Hypertensive heart disease with heart failure	C1400066	hypertensive heart disease; with heart failure	Narrow
ICD10/CM	R09.2	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
ICD10/CM	R09.2	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
ICD10/CM	I50.1	Cardiac asthma	C1956414	Cardiac asthma	Narrow



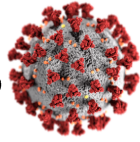
ICD10/CM	I50.1	Cardiac asthma	C1956414	Cardiac asthma	Narrow
ICD10/CM	I50.2	Systolic (congestive) heart failure	C2039715	Systolic (congestive) heart failure	Narrow
ICD10/CM	I50.2	Systolic (congestive) heart failure	C2039715	Systolic (congestive) heart failure	Narrow
ICD10/CM	I50.3	Diastolic (congestive) heart failure	C2183328	Diastolic (congestive) heart failure	Narrow
ICD10/CM	I50.3	Diastolic (congestive) heart failure	C2183328	Diastolic (congestive) heart failure	Narrow
ICD10/CM	I50.33	Acute on chronic diastolic (congestive) heart failure	C2732749	Acute on chronic diastolic heart failure	Narrow
ICD10/CM	I50.23	Acute on chronic systolic (congestive) heart failure	C2733492	Acute on chronic systolic heart failure	Narrow
ICD10/CM	I50.4	Combined systolic and diastolic (congestive) hrt fail	C2882272	Combined systolic (congestive) and diastolic (congestive) heart failure	Narrow
ICD10/CM	I50.4	Combined systolic and diastolic (congestive) hrt fail	C2882272	Combined systolic (congestive) and diastolic (congestive) heart failure	Narrow
ICD10/CM	I50.810	Right ventricular failure NOS	C2939447	Right ventricular failure	Narrow
ICD10/CM	I50.810	Right ventricular failure NOS	C2939447	Right ventricular failure	Narrow
ICD9CM	423.3	Cardiac tamponade	C0007177	Cardiac Tamponade	Narrow
ICD9CM	428	Heart failure	C0018801	Heart failure	Narrow
ICD9CM	428	Heart failure	C0018801	Heart failure	Narrow
ICD9CM	428.9	Heart failure, unspecified	C0018801	Heart failure	Narrow
ICD9CM	428.9	Heart failure, unspecified	C0018801	Heart failure	Narrow
ICD9CM	428.1	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
ICD9CM	428.1	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
ICD9CM	428.1	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
ICD9CM	428.1	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
ICD9CM	398.91	Rheumatic heart failure (congestive)	C0155582	Congestive rheumatic heart failure	Narrow
ICD9CM	398.91	Rheumatic heart failure (congestive)	C0155582	Congestive rheumatic heart failure	Narrow
ICD9CM	415.0	Acute cor pulmonale	C0155672	Acute cor pulmonale	Possible
ICD9CM	514	Pulmonary congestion and hypostasis	C0155910	Pulmonary congestion and hypostasis	Possible
ICD9CM	518.4	Acute edema of lung, unspecified	C0155919	Acute pulmonary edema	Possible
ICD9CM	518.4	Acute edema of lung, unspecified	C0155919	Acute pulmonary edema	Possible
ICD9CM	428.2	Systolic heart failure	C1135191	Heart Failure, Systolic	Narrow
ICD9CM	428.2	Systolic heart failure	C1135191	Heart Failure, Systolic	Narrow
ICD9CM	428.20	Systolic heart failure, unspecified	C1135191	Heart Failure, Systolic	Narrow
ICD9CM	428.20	Systolic heart failure, unspecified	C1135191	Heart Failure, Systolic	Narrow
ICD9CM	428.3	Diastolic heart failure	C1135196	Heart Failure, Diastolic	Narrow
ICD9CM	428.3	Diastolic heart failure	C1135196	Heart Failure, Diastolic	Narrow
ICD9CM	428.30	Diastolic heart failure, unspecified	C1135196	Heart Failure, Diastolic	Narrow
ICD9CM	428.30	Diastolic heart failure, unspecified	C1135196	Heart Failure, Diastolic	Narrow



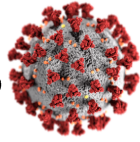
ICD9CM	402.91	Unspecified hypertensive heart disease with heart failure	C1135333	Unspecified hypertensive heart disease with heart failure	Narrow
ICD9CM	404.01	Hypertensive heart and chronic kidney disease, malignant, with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	C1719465	Hypertensive heart and chronic kidney disease, malignant, with heart failure and with chronic kidney disease stage I through stage IV, or unspecified	Narrow
ICD9CM	404.03	Hypertensive heart and chronic kidney disease, malignant, with heart failure and with chronic kidney disease stage V or end stage renal disease	C1719467	Hypertensive heart and chronic kidney disease, malignant, with heart failure and with chronic kidney disease stage V or end stage renal disease	Narrow
ICD9CM	428.21	Acute systolic heart failure	C2732748	Acute systolic heart failure	Narrow
ICD9CM	428.33	Acute on chronic diastolic heart failure	C2732749	Acute on chronic diastolic heart failure	Narrow
ICD9CM	428.31	Acute diastolic heart failure	C2732951	Acute diastolic heart failure	Narrow
ICD9CM	428.23	Acute on chronic systolic heart failure	C2733492	Acute on chronic systolic heart failure	Narrow
ICD9CM	402.*	Hypertensive heart disease.			Possible
ICD9CM	404.11-13	Hypertensive heart and chronic kidney disease, benign, with heart failure			narrow
ICD9CM	404.91-93	Hypertensive heart and chronic kidney disease with heart failure			narrow
ICPC	K77	Heart failure	C0018801	Heart failure	Narrow
RCD2	G53z.	Other pericardial disease NOS	C0007177	Cardiac Tamponade	Narrow
RCD2	G58..	Heart failure	C0018801	Heart failure	Narrow
RCD2	G58z.	Heart failure NOS	C0018801	Heart failure	Narrow
RCD2	G58z.	Heart failure NOS	C0018801	Heart failure	Narrow
RCD2	G581.	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
RCD2	G581.	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
RCD2	H541z	Pulmonary oedema NOS	C0034063	Pulmonary Edema	Possible
RCD2	H5853	Adult respiratory distress syn	C0035222	Respiratory Distress Syndrome, Adult	Possible
RCD2	R0234	[D]Peripheral oedema	C0085649	Peripheral edema	Possible
RCD2	G400.	Acute cor pulmonale	C0155672	Acute cor pulmonale	Possible
RCD2	H54..	Pulmon.congestion/hypostasis	C0155910	Pulmonary congestion and hypostasis	Possible
RCD2	H54z.	Pulmon.congest./hypostasis NOS	C0155910	Pulmonary congestion and hypostasis	Possible
RCD2	H541z	Pulmonary oedema NOS	C0155919	Acute pulmonary edema	Possible
RCD2	H541z	Pulmonary oedema NOS	C0155919	Acute pulmonary edema	Possible
RCD2	H584.	Acute pulmonary oedema unspec.	C0155919	Acute pulmonary edema	Possible
RCD2	H584.	Acute pulmonary oedema unspec.	C0155919	Acute pulmonary edema	Possible
RCD2	H584z	Acute pulmonary oedema NOS	C0155919	Acute pulmonary edema	Possible
RCD2	H584z	Acute pulmonary oedema NOS	C0155919	Acute pulmonary edema	Possible
RCD2	H541.	Pulmonary congestion	C0242073	Pulmonary congestion	Possible



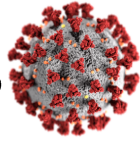
RCD2	H541.	Pulmonary congestion	C0242073	Pulmonary congestion	Possible
RCD2	G21z1	Hypertens.heart dis.NOS- + CCF	C0264650	Hypertensive heart disease with congestive heart failure	Narrow
RCD2	G5800	Acute congestive heart failure	C0264719	Acute congestive heart failure	Narrow
RCD2	G5y30	Atrial dilatation	C0264734	Atrial dilatation	Possible
RCD2	G5y34	Ventricular hypertrophy	C0340279	Ventricular hypertrophy	Possible
RCD2	SP111	Cardiac insuffic.comp.of care	C0340510	Heart failure as a complication of care	Narrow
RCD2	SP111	Cardiac insuffic.comp.of care	C0340510	Heart failure as a complication of care	Narrow
RCD2	G5y4.	Post cardiac opn.function dist	C0340511	Post cardiac operation functional disturbance	Possible
RCD2	Q48y1	Congenital cardiac failure	C0410933	Congenital cardiac failure	Narrow
RCD2	33BB.	Left ventric ejectn fraction	C0428772	Left ventricular ejection fraction	Possible
RCD2	Q490.	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow
RCD2	Q490.	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow
RCD2	G232.	Hypert ht&ren d+(congs)ht fail	C0494575	Hypertensive heart and renal disease with (congestive) heart failure	Narrow
RCD2	33BA.	Impaired left ventricular func	C0553982	Impaired left ventricular function	Narrow
RCD2	33BA.	Impaired left ventricular func	C0553982	Impaired left ventricular function	Narrow
RCD2	G5803	Compensated cardiac failure	C0581376	Compensated cardiac failure	Narrow
RCD2	G5802	Decompensated cardiac failure	C0581377	Decompensated cardiac failure	Narrow
RCD2	G5802	Decompensated cardiac failure	C0581377	Decompensated cardiac failure	Narrow
RCD2	G5802	Decompensated cardiac failure	C0581377	Decompensated cardiac failure	Narrow
RCD2	G580.	Congestive heart failure	C0685095	Biventricular congestive heart failure	Narrow
RCD2	G580.	Congestive heart failure	C0685095	Biventricular congestive heart failure	Narrow
RCD2	G5810	Acute left ventricular failure	C1306063	Acute left ventricular failure	Narrow
RCD2	G5810	Acute left ventricular failure	C1306063	Acute left ventricular failure	Narrow
RCD2	G575.	Cardiac arrest	C1444565	Cardiorespiratory failure	Possible
RCD2	G575.	Cardiac arrest	C1444565	Cardiorespiratory failure	Possible
RCD2	R2y10	[D]Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
RCD2	R2y10	[D]Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
RCD2	G580.	Congestive heart failure	C2939447	Right ventricular failure	Narrow
RCD2	G580.	Congestive heart failure	C2939447	Right ventricular failure	Narrow
RCD2	G584.	Right ventricular failure	C2939447	Right ventricular failure	Narrow
RCD2	G584.	Right ventricular failure	C2939447	Right ventricular failure	Narrow
RCD2	G1yz1	Rheumatic left ventricular failure			narrow
RCD2	G582.	Acute heart failure			narrow
SCTSPA	35304003	taponamiento cardíaco	C0007177	Cardiac Tamponade	Narrow
SCTSPA	89555002	edema cardíaco	C0013608	Edema, Cardiac	Possible



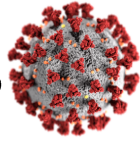
SCTSPA	84114007	insuficiencia cardíaca	C0018801	Heart failure	Narrow
SCTSPA	84114007	insuficiencia cardíaca	C0018801	Heart failure	Narrow
SCTSPA	155377000	Heart failure NOS	C0018801	Heart failure	Narrow
SCTSPA	155377000	Heart failure NOS	C0018801	Heart failure	Narrow
SCTSPA	266248006	insuficiencia cardíaca, SAI	C0018801	Heart failure	Narrow
SCTSPA	266248006	insuficiencia cardíaca, SAI	C0018801	Heart failure	Narrow
SCTSPA	85232009	insuficiencia ventricular izquierda	C0023212	Left-Sided Heart Failure	Narrow
SCTSPA	85232009	insuficiencia ventricular izquierda	C0023212	Left-Sided Heart Failure	Narrow
SCTSPA	85232009	insuficiencia ventricular izquierda	C0023212	Left-Sided Heart Failure	Narrow
SCTSPA	85232009	insuficiencia ventricular izquierda	C0023212	Left-Sided Heart Failure	Narrow
SCTSPA	19242006	edema pulmonar	C0034063	Pulmonary Edema	Possible
SCTSPA	196119001	edema pulmonar, SAI	C0034063	Pulmonary Edema	Possible
SCTSPA	67782005	síndrome de distrés respiratorio agudo	C0035222	Respiratory Distress Syndrome, Adult	Possible
SCTSPA	82014009	edema periférico	C0085649	Peripheral edema	Possible
SCTSPA	206893004	[D]edema periférico	C0085649	Peripheral edema	Possible
SCTSPA	271809000	edema periférico	C0085649	Peripheral edema	Possible
SCTSPA	424372002	edema de extremidad	C0085649	Peripheral edema	Possible
SCTSPA	82523003	insuficiencia cardíaca congestiva reumática	C0155582	Congestive rheumatic heart failure	Narrow
SCTSPA	82523003	insuficiencia cardíaca congestiva reumática	C0155582	Congestive rheumatic heart failure	Narrow
SCTSPA	49584005	cor pulmonale agudo	C0155672	Acute cor pulmonale	Possible
SCTSPA	196115007	congestión e hipostasis pulmonar	C0155910	Pulmonary congestion and hypostasis	Possible
SCTSPA	196120007	hipostasis y congestión pulmonar, SAI	C0155910	Pulmonary congestion and hypostasis	Possible
SCTSPA	40541001	edema agudo de pulmón	C0155919	Acute pulmonary edema	Possible
SCTSPA	40541001	edema agudo de pulmón	C0155919	Acute pulmonary edema	Possible
SCTSPA	123262009	edema agudo de pulmón - RETIRADO -	C0155919	Acute pulmonary edema	Possible
SCTSPA	123262009	edema agudo de pulmón - RETIRADO -	C0155919	Acute pulmonary edema	Possible
SCTSPA	196148007	edema pulmonar agudo no especificado	C0155919	Acute pulmonary edema	Possible
SCTSPA	196148007	edema pulmonar agudo no especificado	C0155919	Acute pulmonary edema	Possible
SCTSPA	196149004	edema pulmonar agudo, SAI	C0155919	Acute pulmonary edema	Possible
SCTSPA	196149004	edema pulmonar agudo, SAI	C0155919	Acute pulmonary edema	Possible
SCTSPA	128404006	insuficiencia cardíaca derecha	C0235527	Heart Failure, Right-Sided	Narrow
SCTSPA	67599009	congestión pulmonar	C0242073	Pulmonary congestion	Possible
SCTSPA	67599009	congestión pulmonar	C0242073	Pulmonary congestion	Possible
SCTSPA	5148006	cardiopatía hipertensiva con insuficiencia cardíaca congestiva	C0264650	Hypertensive heart disease with congestive heart failure	Narrow
SCTSPA	194771003	enfermedad cardíaca hipertensiva, SAI con	C0264650	Hypertensive heart disease with congestive heart failure	Narrow



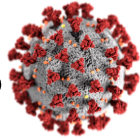
		insuficiencia cardíaca congestiva			
SCTSPA	46113002	insuficiencia cardíaca hipertensiva	C0264652	Hypertensive heart failure	Narrow
SCTSPA	46113002	insuficiencia cardíaca hipertensiva	C0264652	Hypertensive heart failure	Narrow
SCTSPA	10633002	insuficiencia cardíaca congestiva aguda	C0264719	Acute congestive heart failure	Narrow
SCTSPA	82608003	dilatación de aurícula cardíaca	C0264734	Atrial dilatation	Possible
SCTSPA	55565007	insuficiencia cardíaca luego de cirugía obstétrica Y/U otro procedimiento incluido el parto	C0269926	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	Narrow
SCTSPA	55565007	insuficiencia cardíaca luego de cirugía obstétrica Y/U otro procedimiento incluido el parto	C0269926	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	Narrow
SCTSPA	89819002	insuficiencia cardíaca durante un procedimiento Y/O como consecuencia de él	C0274379	Cardiac insufficiency during AND/OR resulting from a procedure	Narrow
SCTSPA	266249003	hipertrofia ventricular	C0340279	Ventricular hypertrophy	Possible
SCTSPA	233924009	insuficiencia cardíaca como complicación de la atención médica	C0340510	Heart failure as a complication of care	Narrow
SCTSPA	233924009	insuficiencia cardíaca como complicación de la atención médica	C0340510	Heart failure as a complication of care	Narrow
SCTSPA	269299003	insuficiencia cardíaca como una complicación de la atención	C0340510	Heart failure as a complication of care	Narrow
SCTSPA	269299003	insuficiencia cardíaca como una complicación de la atención	C0340510	Heart failure as a complication of care	Narrow
SCTSPA	195130005	trastorno funcional postcirugía cardíaca	C0340511	Post cardiac operation functional disturbance	Possible
SCTSPA	233928007	disfunción miocárdica	C0340515	Myocardial dysfunction	Narrow
SCTSPA	233928007	disfunción miocárdica	C0340515	Myocardial dysfunction	Narrow
SCTSPA	233928007	disfunción miocárdica	C0340515	Myocardial dysfunction	Narrow
SCTSPA	206586007	insuficiencia cardíaca congénita	C0410933	Congenital cardiac failure	Narrow
SCTSPA	250908004	fracción de eyección del ventrículo izquierdo	C0428772	Left ventricular ejection fraction	Possible
SCTSPA	276514007	insuficiencia cardíaca neonatal	C0455993	Neonatal cardiac failure	Narrow
SCTSPA	276514007	insuficiencia cardíaca neonatal	C0455993	Neonatal cardiac failure	Narrow
SCTSPA	194779001	cardiopatía y nefropatía hipertensivas con insuficiencia cardíaca (congestiva)	C0494575	Hypertensive heart and renal disease with (congestive) heart failure	Narrow
SCTSPA	195112003	insuficiencia cardíaca compensada	C0581376	Compensated cardiac failure	Narrow
SCTSPA	195111005	insuficiencia cardíaca descompensada	C0581377	Decompensated cardiac failure	Narrow
SCTSPA	195111005	insuficiencia cardíaca descompensada	C0581377	Decompensated cardiac failure	Narrow
SCTSPA	195111005	insuficiencia cardíaca descompensada	C0581377	Decompensated cardiac failure	Narrow
SCTSPA	92506005	insuficiencia cardíaca congestiva biventricular	C0685095	Biventricular congestive heart failure	Narrow
SCTSPA	92506005	insuficiencia cardíaca congestiva biventricular	C0685095	Biventricular congestive heart failure	Narrow
SCTSPA	417996009	insuficiencia cardíaca sistólica	C1135191	Heart Failure, Systolic	Narrow



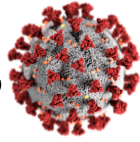
SCTSPA	417996009	insuficiencia cardíaca sistólica	C1135191	Heart Failure, Systolic	Narrow
SCTSPA	418304008	insuficiencia cardíaca diastólica	C1135196	Heart Failure, Diastolic	Narrow
SCTSPA	418304008	insuficiencia cardíaca diastólica	C1135196	Heart Failure, Diastolic	Narrow
SCTSPA	195114002	insuficiencia aguda del ventrículo izquierdo	C1306063	Acute left ventricular failure	Narrow
SCTSPA	195114002	insuficiencia aguda del ventrículo izquierdo	C1306063	Acute left ventricular failure	Narrow
SCTSPA	207553000	[D]insuficiencia cardiorrespiratoria	C1444565	Cardiorespiratory failure	Possible
SCTSPA	207553000	[D]insuficiencia cardiorrespiratoria	C1444565	Cardiorespiratory failure	Possible
SCTSPA	410431009	insuficiencia cardiorrespiratoria	C1444565	Cardiorespiratory failure	Possible
SCTSPA	410431009	insuficiencia cardiorrespiratoria	C1444565	Cardiorespiratory failure	Possible
SCTSPA	71892000	asma cardíaca	C1956414	Cardiac asthma	Narrow
SCTSPA	71892000	asma cardíaca	C1956414	Cardiac asthma	Narrow
SCTSPA	84114007	fallo miocárdico	C1959583	Myocardial Failure	Narrow
SCTSPA	84114007	fallo miocárdico	C1959583	Myocardial Failure	Narrow
SCTSPA	443254009	insuficiencia cardíaca sistólica aguda	C2732748	Acute systolic heart failure	Narrow
SCTSPA	443344007	insuficiencia cardíaca distólica crónica reagudizada	C2732749	Acute on chronic diastolic heart failure	Narrow
SCTSPA	443343001	insuficiencia cardíaca diastólica aguda	C2732951	Acute diastolic heart failure	Narrow
SCTSPA	443253003	insuficiencia cardíaca sistólica crónica reagudizada	C2733492	Acute on chronic systolic heart failure	Narrow
SCTSPA	367363000	insuficiencia del ventrículo derecho	C2939447	Right ventricular failure	Narrow
SCTSPA	367363000	insuficiencia del ventrículo derecho	C2939447	Right ventricular failure	Narrow
SCTSPA	55827005	Left ventricular hypertrophy (disorder)			Possible
SCTSPA	42343007	Congestive heart failure (disorder)			Narrow
SCTSPA	442304009	Combined systolic and diastolic dysfunction (finding)			Possible
SCTSPA	56675007	Acute heart failure (disorder)			Narrow
SCTSPA	89792004	Right ventricular hypertrophy (disorder)			Possible
SCTSPA	83291003	Cor pulmonale (disorder)			Possible
SCTSPA	102558002	Edema of the upper extremity (finding)			Possible
SNOMEDCT_US	35304003	Cardiac tamponade	C0007177	Cardiac Tamponade	Narrow
SNOMEDCT_US	155341007	Cardiac tamponade	C0007177	Cardiac Tamponade	Narrow
SNOMEDCT_US	194975004	Cardiac tamponade	C0007177	Cardiac Tamponade	Narrow
SNOMEDCT_US	266295005	Cardiac tamponade	C0007177	Cardiac Tamponade	Narrow
SNOMEDCT_US	89555002	Cardiac edema	C0013608	Edema, Cardiac	Possible
SNOMEDCT_US	84114007	Heart failure	C0018801	Heart failure	Narrow
SNOMEDCT_US	84114007	Heart failure	C0018801	Heart failure	Narrow
SNOMEDCT_US	155374007	Heart failure	C0018801	Heart failure	Narrow



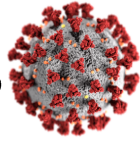
SNOMEDCT_US	155374007	Heart failure	C0018801	Heart failure	Narrow
SNOMEDCT_US	155375008	Insufficiency - cardiac	C0018801	Heart failure	Narrow
SNOMEDCT_US	155375008	Insufficiency - cardiac	C0018801	Heart failure	Narrow
SNOMEDCT_US	155377000	Heart failure NOS	C0018801	Heart failure	Narrow
SNOMEDCT_US	155377000	Heart failure NOS	C0018801	Heart failure	Narrow
SNOMEDCT_US	195117009	Cardiac failure NOS	C0018801	Heart failure	Narrow
SNOMEDCT_US	195117009	Cardiac failure NOS	C0018801	Heart failure	Narrow
SNOMEDCT_US	266248006	Heart failure NOS	C0018801	Heart failure	Narrow
SNOMEDCT_US	266248006	Heart failure NOS	C0018801	Heart failure	Narrow
SNOMEDCT_US	266308000	Insufficiency - cardiac	C0018801	Heart failure	Narrow
SNOMEDCT_US	266308000	Insufficiency - cardiac	C0018801	Heart failure	Narrow
SNOMEDCT_US	85232009	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	85232009	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	85232009	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	85232009	Left heart failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	155376009	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	155376009	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	155376009	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	155376009	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	195113008	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	195113008	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	195113008	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	195113008	Left ventricular failure	C0023212	Left-Sided Heart Failure	Narrow
SNOMEDCT_US	19242006	Pulmonary edema	C0034063	Pulmonary Edema	Possible
SNOMEDCT_US	196119001	Pulmonary edema NOS	C0034063	Pulmonary Edema	Possible
SNOMEDCT_US	266408001	Edema - pulmonary NOS	C0034063	Pulmonary Edema	Possible
SNOMEDCT_US	67782005	Acute respiratory distress syndrome	C0035222	Respiratory Distress Syndrome, Adult	Possible
SNOMEDCT_US	155627006	Adult respiratory distress syndrome	C0035222	Respiratory Distress Syndrome, Adult	Possible
SNOMEDCT_US	196150004	Adult respiratory distress syndrome	C0035222	Respiratory Distress Syndrome, Adult	Possible
SNOMEDCT_US	196154008	Adult respiratory distress syndrome	C0035222	Respiratory Distress Syndrome, Adult	Possible
SNOMEDCT_US	206281003	Respiratory distress syndrome	C0035222	Respiratory Distress Syndrome, Adult	Possible
SNOMEDCT_US	266411000	Adult respiratory distress syndrome	C0035222	Respiratory Distress Syndrome, Adult	Possible



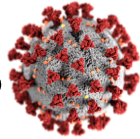
SNOMEDCT_US	82014009	Peripheral edema	C0085649	Peripheral edema	Possible
SNOMEDCT_US	158246003	[D]Peripheral edema	C0085649	Peripheral edema	Possible
SNOMEDCT_US	206893004	[D]Peripheral edema	C0085649	Peripheral edema	Possible
SNOMEDCT_US	271809000	Peripheral edema	C0085649	Peripheral edema	Possible
SNOMEDCT_US	424372002	Edema of extremity	C0085649	Peripheral edema	Possible
SNOMEDCT_US	82523003	Congestive rheumatic heart failure	C0155582	Congestive rheumatic heart failure	Narrow
SNOMEDCT_US	82523003	Congestive rheumatic heart failure	C0155582	Congestive rheumatic heart failure	Narrow
SNOMEDCT_US	49584005	Acute cor pulmonale	C0155672	Acute cor pulmonale	Possible
SNOMEDCT_US	155325006	Acute cor pulmonale	C0155672	Acute cor pulmonale	Possible
SNOMEDCT_US	194881008	Acute cor pulmonale	C0155672	Acute cor pulmonale	Possible
SNOMEDCT_US	196115007	Pulmonary congestion and hypostasis	C0155910	Pulmonary congestion and hypostasis	Possible
SNOMEDCT_US	196120007	Pulmonary congestion and hypostasis NOS	C0155910	Pulmonary congestion and hypostasis	Possible
SNOMEDCT_US	40541001	Acute pulmonary edema	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	40541001	Acute pulmonary edema	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	123262009	Acute edema of lung, NOS	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	123262009	Acute edema of lung, NOS	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	195113008	Pulmonary edema - acute	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	195113008	Pulmonary edema - acute	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	196148007	Acute edema of lung, unspecified	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	196148007	Acute edema of lung, unspecified	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	196149004	Acute pulmonary edema NOS	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	196149004	Acute pulmonary edema NOS	C0155919	Acute pulmonary edema	Possible
SNOMEDCT_US	128404006	Right heart failure	C0235527	Heart Failure, Right-Sided	Narrow
SNOMEDCT_US	67599009	Pulmonary congestion	C0242073	Pulmonary congestion	Possible
SNOMEDCT_US	67599009	Pulmonary congestion	C0242073	Pulmonary congestion	Possible
SNOMEDCT_US	196118009	Pulmonary congestion	C0242073	Pulmonary congestion	Possible
SNOMEDCT_US	196118009	Pulmonary congestion	C0242073	Pulmonary congestion	Possible
SNOMEDCT_US	266408001	Congestion - lung	C0242073	Pulmonary congestion	Possible
SNOMEDCT_US	266408001	Congestion - lung	C0242073	Pulmonary congestion	Possible
SNOMEDCT_US	5148006	Hypertensive heart disease with congestive heart failure	C0264650	Hypertensive heart disease with congestive heart failure	Narrow
SNOMEDCT_US	194771003	Hypertensive heart disease NOS with congestive cardiac failure	C0264650	Hypertensive heart disease with congestive heart failure	Narrow
SNOMEDCT_US	46113002	Hypertensive heart failure	C0264652	Hypertensive heart failure	Narrow



SNOMEDCT_US	46113002	Hypertensive heart failure	C0264652	Hypertensive heart failure	Narrow
SNOMEDCT_US	10633002	Acute congestive heart failure	C0264719	Acute congestive heart failure	Narrow
SNOMEDCT_US	195109001	Acute congestive heart failure	C0264719	Acute congestive heart failure	Narrow
SNOMEDCT_US	82608003	Atrial dilatation	C0264734	Atrial dilatation	Possible
SNOMEDCT_US	195123004	Atrial dilatation	C0264734	Atrial dilatation	Possible
SNOMEDCT_US	55565007	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	C0269926	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	Narrow
SNOMEDCT_US	55565007	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	C0269926	Cardiac failure after obstetrical surgery AND/OR other procedure including delivery	Narrow
SNOMEDCT_US	89819002	Cardiac insufficiency during AND/OR resulting from a procedure	C0274379	Cardiac insufficiency during AND/OR resulting from a procedure	Narrow
SNOMEDCT_US	155383002	Ventricular hypertrophy	C0340279	Ventricular hypertrophy	Possible
SNOMEDCT_US	195127003	Ventricular hypertrophy	C0340279	Ventricular hypertrophy	Possible
SNOMEDCT_US	266249003	Ventricular hypertrophy	C0340279	Ventricular hypertrophy	Possible
SNOMEDCT_US	266310003	Ventricular hypertrophy	C0340279	Ventricular hypertrophy	Possible
SNOMEDCT_US	213214001	Cardiac insufficiency as a complication of care	C0340510	Heart failure as a complication of care	Narrow
SNOMEDCT_US	213214001	Cardiac insufficiency as a complication of care	C0340510	Heart failure as a complication of care	Narrow
SNOMEDCT_US	233924009	Heart failure as a complication of care	C0340510	Heart failure as a complication of care	Narrow
SNOMEDCT_US	233924009	Heart failure as a complication of care	C0340510	Heart failure as a complication of care	Narrow
SNOMEDCT_US	269299003	Cardiac insufficiency as a complication of care	C0340510	Heart failure as a complication of care	Narrow
SNOMEDCT_US	269299003	Cardiac insufficiency as a complication of care	C0340510	Heart failure as a complication of care	Narrow
SNOMEDCT_US	195130005	Post cardiac operation functional disturbance	C0340511	Post cardiac operation functional disturbance	Possible
SNOMEDCT_US	233928007	Myocardial dysfunction	C0340515	Myocardial dysfunction	Narrow
SNOMEDCT_US	233928007	Myocardial dysfunction	C0340515	Myocardial dysfunction	Narrow
SNOMEDCT_US	233928007	Myocardial dysfunction	C0340515	Myocardial dysfunction	Narrow
SNOMEDCT_US	206586007	Congenital cardiac failure	C0410933	Congenital cardiac failure	Narrow
SNOMEDCT_US	250908004	Left ventricular ejection fraction	C0428772	Left ventricular ejection fraction	Possible
SNOMEDCT_US	389385008	Left ventricular ejection fraction	C0428772	Left ventricular ejection fraction	Possible
SNOMEDCT_US	390116000	Left ventricular ejection fraction	C0428772	Left ventricular ejection fraction	Possible
SNOMEDCT_US	206594000	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow
SNOMEDCT_US	206594000	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow
SNOMEDCT_US	276514007	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow
SNOMEDCT_US	276514007	Neonatal cardiac failure	C0455993	Neonatal cardiac failure	Narrow



SNOMEDCT_US	194779001	Hypertensive heart and renal disease with (congestive) heart failure	C0494575	Hypertensive heart and renal disease with (congestive) heart failure	Narrow
SNOMEDCT_US	195112003	Compensated cardiac failure	C0581376	Compensated cardiac failure	Narrow
SNOMEDCT_US	195111005	Decompensated cardiac failure	C0581377	Decompensated cardiac failure	Narrow
SNOMEDCT_US	195111005	Decompensated cardiac failure	C0581377	Decompensated cardiac failure	Narrow
SNOMEDCT_US	195111005	Decompensated cardiac failure	C0581377	Decompensated cardiac failure	Narrow
SNOMEDCT_US	92506005	Biventricular congestive heart failure	C0685095	Biventricular congestive heart failure	Narrow
SNOMEDCT_US	92506005	Biventricular congestive heart failure	C0685095	Biventricular congestive heart failure	Narrow
SNOMEDCT_US	195108009	Biventricular failure	C0685095	Biventricular congestive heart failure	Narrow
SNOMEDCT_US	195108009	Biventricular failure	C0685095	Biventricular congestive heart failure	Narrow
SNOMEDCT_US	417996009	Systolic heart failure	C1135191	Heart Failure, Systolic	Narrow
SNOMEDCT_US	417996009	Systolic heart failure	C1135191	Heart Failure, Systolic	Narrow
SNOMEDCT_US	418304008	Diastolic heart failure	C1135196	Heart Failure, Diastolic	Narrow
SNOMEDCT_US	418304008	Diastolic heart failure	C1135196	Heart Failure, Diastolic	Narrow
SNOMEDCT_US	85232009	Acute edema of lung with heart disease	C1306063	Acute left ventricular failure	Narrow
SNOMEDCT_US	85232009	Acute edema of lung with heart disease	C1306063	Acute left ventricular failure	Narrow
SNOMEDCT_US	195114002	Acute left ventricular failure	C1306063	Acute left ventricular failure	Narrow
SNOMEDCT_US	195114002	Acute left ventricular failure	C1306063	Acute left ventricular failure	Narrow
SNOMEDCT_US	30298009	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	30298009	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	158732004	[D]Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	158732004	[D]Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	207553000	[D]Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	207553000	[D]Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	397912004	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	397912004	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	410431009	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	410431009	Cardiorespiratory failure	C1444565	Cardiorespiratory failure	Possible
SNOMEDCT_US	71892000	Cardiac asthma	C1956414	Cardiac asthma	Narrow
SNOMEDCT_US	71892000	Cardiac asthma	C1956414	Cardiac asthma	Narrow
SNOMEDCT_US	195113008	Asthma - cardiac	C1956414	Cardiac asthma	Narrow
SNOMEDCT_US	195113008	Asthma - cardiac	C1956414	Cardiac asthma	Narrow
SNOMEDCT_US	84114007	Myocardial failure	C1959583	Myocardial Failure	Narrow



SNOMEDCT_US	84114007	Myocardial failure	C1959583	Myocardial Failure	Narrow
SNOMEDCT_US	443254009	Acute systolic heart failure	C2732748	Acute systolic heart failure	Narrow
SNOMEDCT_US	443344007	Acute on chronic diastolic heart failure	C2732749	Acute on chronic diastolic heart failure	Narrow
SNOMEDCT_US	443343001	Acute diastolic heart failure	C2732951	Acute diastolic heart failure	Narrow
SNOMEDCT_US	443253003	Acute on chronic systolic heart failure	C2733492	Acute on chronic systolic heart failure	Narrow
SNOMEDCT_US	155375008	Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	155375008	Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	195108009	Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	195108009	Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	233925005	RHF - Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	233925005	RHF - Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	266308000	Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	266308000	Right heart failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	367363000	Right ventricular failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	367363000	Right ventricular failure	C2939447	Right ventricular failure	Narrow
SNOMEDCT_US	42343007	Congestive heart failure (disorder)			Narrow

10. Algorithm proposal

Broad algorithm:

- All concept sets = Any of the codes in any provenance, no prior codes
- Index date: first occurrence of any of these concept sets

Narrow algorithm:

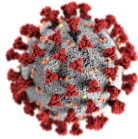
- Concept set = (Heart_failure, Chronic_Heart_failure, Neonatal_heart_failure) (no prior codes)
- Index date: first occurrence of any of these concept sets

11. Background rates

from Groeneweg et al. 2020 (Groenewegen Frans H. Rutten Arend Mosterd Arno W. Hoes. Epidemiology of heart failure <https://doi.org/10.1002/ejhf.1858>)

“The incidence of heart failure in European countries and the USA ranges widely from 1 to 9 cases per 1000 person-years and strongly depends, on the population studied and the diagnostic criteria used. In developed countries, incidence rates have stabilized between 1970 and 1990 and are now thought to be decreasing”

Heart failure



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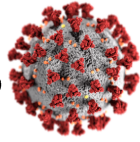
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