

Therapy

Therapy approach for all patients with chronic heart failure

Control and risk factor management as well as causal therapy approaches

To control arterial hypertension; myocardium revascularization when myocardial ischemia certain; therapy for valvular defect (operation, balloon valvuloplasty), pacemaker therapy / anti-arrhythmic therapy in case of CHF caused by arrhythmia; therapy for thyroid dysfunction; anemia diagnostics and correction; treatment to abstain from drinking alcohol in patients with alcohol-related heart failure; therapy for pericardial diseases (see Ch. 2.2.1).

Non-pharmacological therapy

Exercise training **A**; restrict salt intake: “no-salt-added diet” **C**; lifestyle changes **C**
 Vaccinations: annual influenza vaccination; pneumococcal immunization every six years **C** (see Ch. 2.2.2).

Systolic heart failure			Diastolic heart failure ²	
NYHA I	NYHA II	NYHA III-IV ²		
Unless contraindicated, reduces mortality: Titrate ACE inhibitors to target dosage/maximum tolerated dose A (see Ch. 2.2.3.1.1.1) After myocardial infarction add β -receptor blockers, titrate to target dosage / maximum tolerated dose A (see Ch. 2.2.3.1.1.2)	Unless contraindicated, reduces mortality: Titrate ACE inhibitors to target dose / maximum tolerated dose A (see Ch. 2.2.3.1.1.1) In case of ACE inhibitor induced cough, change to angiotensin receptor blockers A (see Ch. 2.2.3.1.1.1 und 2.2.3.1.1.4) Titrate β -Blocker (Bisoprolol, Carvedilol or Metoprolol succinate (extended release)) to target dose / maximum tolerated dose A (see Ch. 2.2.3.1.1.2)		K Control hypertension A E mpirical therapy recommendations without supporting evidence: β -Blockers low dosage to extend diastoles C	
	Symptomatic in case of liquid retention: Diuretics (Thiazides and/or loop diuretics) A (see Ch. 2.2.3.1.2.1)			Diuretics where appropriate but with caution C
		Unless contraindicated, reduces mortality: (see Ch. 2.2.3.1.1.3) Low dose of Spironolacton A Cave! Potential for hyperkalemia!!		
		Symptomatic with concomitant atrial fibrillation: oral anticoagulants in accordance with total risk considerations, in combination with digitalis glycosides where appropriate (control frequency at rest), continue to give β-Blockers! B (see Ch. 2.2.3.1.2.2 und 2.2.3.1.3.4)		ACE-Inhibitors where appropriate, or consider AT ₁ -Blockers in case of intolerance C
		Symptomatic with sinus rhythm and unchanged or progressive symptoms when undergoing above therapy: Consider digitalis glycosides without loading dose A (see Ch. 2.2.3.1.2.2)		
		Non-pharmacological therapy: restrict fluid intake C		

² seek cooperation with cardiologist, see Ch. 2.2.3.2

Strength of recommendations

- A** based on scientific studies of high quality,
- B** based on other studies,
- C** based on general consensus or expert opinion

Short Version

Definition

Inability of the heart to pump sufficient blood to meet the oxygen and thus the metabolic needs of the body, either under conditions of stress or at rest.

Functional NYHA classification	
I	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or angina.
II	Slight limitation of physical activity. Ordinary physical activity results in fatigue, palpitation, dyspnea, or angina.
III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary physical activity results in fatigue, palpitation, dyspnea, or angina.
IV	Unable to carry on any physical activity without discomfort. Symptoms are present at rest. With any physical activity, symptoms increase.

Adapted from the Criteria Committee of the American Heart Association. 1994 revisions to the classification of functional capacity and objective assessment of patients with disease of the heart. *Circulation* 1994;90:644-5.

Causes

Coronary heart disease (CHD) (myocardial infarction, ischemia), **arterial hypertension** und atrial fibrillation; rare forms of cardiomyopathy (*dilatative*: toxic, eg alcohol, drugs, medicaments; *hypertrophic +/- obstruction*; *restrictive*) as well as valvular defects (hereditary/ acquired), high output failure (anemia, thyroid toxicosis, arteriovenous fistula) and pericardial diseases.

Acute decompensation of chronic heart failure (emergency situations): see long version, part 1, chapter 1.3

- ! **Cardiac arrest** → cardiopulmonary reanimation.
- ! **Acute myocardial ischemia** → see acute myocardial infarction.
- ! **Cardiogenic shock with edema of lung** → primary care: raise upper body, lower legs, enter vein, inject furosemide and morphine, in case of systolic blood pressure > 100 mmHg nitro beneath the tongue or i.v.¹ / in case of systolic blood pressure < 100 mmHg no medication to reduce blood pressure, if possible inject dobutamine i.v.¹; give oxygen in case of shortness of breath, intubation or masked artificial respiration → hospitalisation in company of physician!
- ! **Tachyarrhythmia** → in case of edema of lung and signs of cardiogenic shock: as above + Digoxin i.v.; → no acute decompensation: digitalisation and anticoagulation if appropriate plus immediate visit to cardiologist, hospitalisation if necessary (clinical condition of patient).
- ! **Other signs of bradycardiac / tachycardiac episodes of arrhythmia** → in case of edema of lung and signs of cardiogenic shock: as above; → no acute decompensation: rest, bradycardiac medication and hospitalisation if necessary.
- ! **Pneumonia and severe respiratory infections** → in case of infection and signs of cardiogenic shock: as above; → no acute decompensation: hospitalisation recommended as decompensation of heart failure often exacerbated by infections.
- ! **Volume loss and change in electrolyte levels** (eg diarrhea / vomiting, fever) → in severe cases entailing hypotension/ hypovolemia: hospitalisation; → in mild cases: laboratory examination of electrolyte levels, serum creatinine (in case of glycoside therapy, check serum digoxin concentrations - intoxication?), adjust diuretics.

Prognosis









Up to 40% of patients die in the year following the diagnosis. Among patients of under 65 years of age, 80% of men and 70%

¹ Continuous delivery using Perfusor or Infusomat infusion pump is required

Reasons for seeking advice

Syndromes of reduced exercise tolerance	Syndromes of congestion	No syndromes or signs of chronic heart failure
Shortness of breath, exhaustion, arrhythmia or angina under exertion	Swelling or complaints of pain in the legs or abdomen, congestion	Machine-aided diagnosis indicate reduced left-ventricular function without signs/symptoms

Initial diagnosis by GP: (see long version, part 1, chapter 2.1)

Anamnesis 		
<p>Unspecific complaints!</p> <p><i>Dyspnea</i> (under exertion or while at rest, orthopnea, paroxysmal dyspnea at night);</p> <p><i>Fatigue</i>, undue exhaustion following exertion, weakness, lethargy;</p> <p><i>Liquid retention</i> (swelling of legs or abdomen, increase in weight), nocturia;</p> <p>Dry cough, especially at night;</p> <p>Dizziness, palpitations, fainting;</p> <p>Lack of appetite, nausea, feeling of satiation, meteorism, obstipation, abdominal pain, sometimes weight loss;</p> <p>Memory disruptions, confusion, cognitive impairment.</p>	<p>Promotive factors</p> <p><i>Previous illness</i>: hypertension, CHD, peripheral vascular disease, diabetes, valvular heart disease, rheumatic fever;</p> <p>Thyroid diseases, collagenosis/vasculitis, sarcoidosis, hemachromatosis, pheochromocytoma;</p> <p><i>Exposure</i>: alcohol or drug abuse, chest irradiation, chemotherapy;</p> <p><i>Family history</i>: of atherosclerotic disease, cardiomyopathy, sudden death.</p>	
Physical examination 		
<p>Generally necessary when complaints indicate possibility of chronic heart failure!</p> <p><i>Elevated jugular venous pressure</i> (extent of jugular venous distension, at 45° with raised upper body and slightly reclined head) positive hepatojugular reflux, hepatomegaly</p> <p><i>Displaced (and broadened) apex beat, third heart sound</i>;</p> <p>Pulmonary crackles, which continue after coughing;</p> <p>Tachycardia (heart rate > 90-100/min.), irregular pulse, tachypnoe (> 20/min.);</p> <p>Periphery edema (ankle, lower leg, in case of bed ridden patients also presacral -in form of anasarca, pleural effusions, ascites); increase in weight.</p>		
Laboratory tests and operative diagnostics		
<p>Initial diagnostics (Basis)</p> <p>1. <i>ECG (12-lead)</i>: Unspecific changes, but: completely normal ECG makes chronic heart failure diagnosis <i>improbable</i>; </p> <p>2. <i>Laboratory</i>: blood analysis, serum-electrolytes (sodium, potassium), creatinine, fasting blood glucose, glutamate pyruvate transaminase, urine status; </p> <p>3. <i>B-type natriuretic peptide: testing for BNP as part of routine GP diagnosis not recommended</i>;  pathological level not proof of chronic heart failure. </p>	<p>Supplementary diagnostics </p> <p>In case of <i>edemas</i>: total serum protein +/- albumin, urea, endogenous creatinine clearance;</p> <p>In case of <i>atrial fibrillation or thyroid disease or patients of >65 years of age and in all cases of certain chronic heart failure</i>: check levels of thyroid stimulating hormone and possible FT₃, (FT₄);</p> <p>In case of <i>CHD and recent examination > 5 J</i>: fasting blood lipids;</p> <p>In case of <i>suspected ischemic reaction / myocardial infarction</i>: heart enzymes.</p>	<p>Ultrasound cardiography </p> <p>To support diagnosis in case of clinical suspicion of CHF;</p> <p>Determine cause, type and extent of CHF, causal therapy?</p> <p>Indication for further invasive diagnostics (coronary angiography, biopsy etc.)</p>

Therapy for selected patients

NYHA II - IV and intolerance/contraindications to ACE-Inhibitors and AT₁-Blockers: in cooperation with cardiologists hydralazine and isosorbide dinitrate (see Ch. 2.2.3.1.3.1) **A**

Medications to avoid in case of chronic heart failure (others in Ch. 2.2.4)

Avoid calcium antagonists like Nifedipine, Verapamil and Diltiazem; in case of symptomatic coronary heart disease with angina and/or badly controlled arterial hypertension, consider long-acting dihydroperidine (e.g. Amlodipine) **A**

Non-steroidal anti-inflammatory drugs (NSAIDs) including COX-2 inhibitors (cave - self medication!); exception: low dose of aspirin as preventive treatment for CHD/peripheral vascular disease

Antiarrhythmic class I³ and III⁴ drugs (exception Amiodarone), **other negative inotropic substances:** Carbamazepine, tricyclic antidepressants, Itraconazole and **alpha blockers**

In case of NYHA III - IV: Metformin (associated with lactic acidosis), Thiazolidinediones (rosiglitazone and pioglitazone)

Phytomedicines and dietary supplements (cave self medication!)

³ Chinidin, Ajmalin, Prajmalium, Procainamid, Disopyramid, Flecainid, Lorcainid, Propafenon

⁴ Sotalol

Self monitoring by the patient **C** (see Ch. 2.3.2)

Daily weight control in similar clothing, especially for symptomatic patients:

Consult the doctor if weight increases **> 1 kg over night or > 2 kg within three days or > 2,5 kg within a week**

Undesired side effect of medicine

Coughing is common but only seldom necessitates discontinuation of ACE Inhibitor

Monitoring patient while undergoing therapy **C** (see Ch. 2.3.1)

Assess functional capacity according to NYHA classification, consider further exercise tests (exercise ECG, six minute walking test), quality of life survey

Assess fluid status: weight protocol, clinical examination (jugular venous pressure, pulmonary crackles, hepatomegaly, peripheral edema), measure blood pressure while lying down and after standing up

Assess heart rhythm and rate: control pulse rate, ECG where appropriate, in case of suspected symptomatic arrhythmia: long-term ECG

Review medication: current intake?, side effects?, need for change?

Nutritional status: Attention! Hypervolemia may mask cachexia

Laboratory tests: serum electrolytes (sodium, potassium), urea and creatinine; in addition blood count and liver function tests if appropriate, thyroid function tests, coagulation factors (depending on clinical status and medication intake)

Cooperation with cardiologists and other specialists **C** (see Ch. 2.4)

Initial diagnostic evaluation: Echocardiography and indications for further diagnostic evaluation and causal therapy if necessary

Therapy: always in case of diastolic heart failure, consider in case of problems with therapy (i.e. dosage titration), refractory symptoms, arrhythmia, relevant co-morbidities (e.g. chronic renal insufficiency), arrange regular consultations to follow-up at agreed intervals

Further therapy: patients who remain symptomatic despite implementation of all named therapy options, indications for a heart transplant? Indications for cardiac resynchronization / implantable cardioverter defibrillators? Revascularisation in case of refractory angina? Etc.