

# Heart Failure

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## What is it?

Heart failure is a common condition where your heart is not able to pump blood around your body normally. This means your blood is not able to deliver enough oxygen and nutrients to your body to allow it to work normally. The result is that many of your other organs cannot function efficiently and fluid can build up in your body.

There are several different types of heart failure. Assessment of the structure and function of the pumping chambers in your heart, called your left and right ventricles, using a specialist ultrasound scan of your heart called an **echocardiogram**, is important. This scan may help to identify the causes of your heart failure, and it is also important to guide treatment choices. It measures the performance of your left ventricle and the amount of blood propelled out of your heart and around your body with each heart beat, called your left ventricular ejection fraction (LVEF).

Certain heart failure treatments are proven to work if your LVEF is below 50%, and others if your LVEF is below 40% or 35%.

If you have heart failure and your LVEF is 50% or higher it may help identify specific causes.

## Who gets it?

Heart failure is a common condition, affecting approximately 2% of adults. It is more common with increasing age, with >10% of people aged 70 years or over.

## Causes of Heart Failure

There are many different causes of heart failure and you may have more than one cause.

### iOWNA gem

*If you have heart failure ask your doctor what are the causes of your heart failure? In many people treatments directed at the cause are helpful.*

## Common causes

- Heart attacks and narrowing of your coronary arteries
- High blood pressure
- Heart valve disease – severely narrowed or severely leaking valves can cause heart failure
- Genetic causes – this is where diseases of the heart muscle called a cardiomyopathy runs in families and are also known as inherited cardiomyopathies where a faulty cardiac gene is the cause
- Cancer treatments – certain cancer chemotherapies and some of the modern cancer therapies cause heart muscle damage and weakness
- Abnormal heart rhythms – fast heart rates such as fast atrial fibrillation if left untreated can cause heart failure
- Alcohol – too much alcohol is toxic to the heart muscle
- Amyloidosis – this is a condition where an abnormal protein is deposited in the heart muscle

## Rarer causes

- Viral infections – if a virus infects the heart muscle, known as myocarditis, it can leave damage
- Pregnancy or childbirth – a rare cause is heart failure in women during their pregnancy when their heart needs to work harder, or after the birth of their baby
- Thyroid diseases
- Recreational drugs

### iOWNA gem

*If you are over 70 years old and your LVEF is 50% or higher, ask your doctor if cardiac amyloidosis could be the cause. Amyloidosis is a condition where abnormal protein deposits in the heart muscle making it stiff, and is now recognised as a common cause of heart failure in people over 70 years old.*

*If your LVEF is less than 50% ask your doctor if the blood supply to your heart is normal. Has your heart's own blood supply been checked? This can be easily assessed with a heart perfusion scan.*

## Symptoms

**Fluid retention** – this is a common symptom where fluid builds up on your feet and ankles, and then spreads up your legs as more fluid accumulates. Sometimes it can accumulate in your tummy and cause your tummy to swell. It is the combination of too much salt and water in your body.

**Extreme tiredness** and **general weakness**

**Shortness of breath** – especially when you are lying flat in bed or when you are walking around.

**Palpitations** – this is the feeling of your heart racing fast or ‘jumping’ around in your chest, and may reflect a disturbance of your heart rhythm.

**Dizziness** and **fainting**

**Chest pains**

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*If you are breathless while lying flat in bed at night then use some extra pillows to support you so you can sleep whilst sitting more upright.*

## Treatments

There are a number of different types of treatment and what is right for you will depend on a number of factors.

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*As you may need to take several different medicines for your heart failure, write your medicines including the doses into a medicine chart or diary, this helps you to remember which medicines are to be taken and when. Bring the medication list with you to each appointment with your doctor or nurse to show them what you are taking.*

## Drugs

### – Diuretics

Diuretics are medications which stimulate your kidneys to produce more urine. They help to clear the excess fluid from your legs and tummy, and can also help if you are breathless. There are different types of diuretic. Common diuretics are furosemide, bumetanide, bendroflumethiazide, metolazone and amiloride.

 **iOWNA gem**

*You will need to go to the toilet to pass urine several times in the 2-3 hours after taking a diuretic so make sure you have access to a toilet when you are taking them, and don't take them after 4pm if possible. Plan your schedule each day and the timing of when to take your diuretics according to when you are home where possible. For example if you are going out shopping in the morning perhaps delay taking your diuretics until you have returned home, providing it is not too late.*

## – ACE inhibitors

ACE inhibitors block a hormone system which is overactive in your body and drives worsening heart failure. Examples include Enalapril, Lisinopril and Ramipril. ACE inhibitors have been proven to help prolong life and reduce emergency heart problems in people with heart failure if your LVEF is <50%. Their most common side effect is a dry cough and they can increase potassium levels in your blood.

## – Beta blockers

Beta blockers calm your heart rate and stabilise your heart rhythm. They help protect your heart from stress hormones. Beta blockers have been proven to help prolong life and reduce emergency heart problems in people with heart failure if your LVEF is <50%. Beta blockers also help reduce chest pains and fast palpitations caused by heart failure. Potential side effects include worsening fatigue (although they usually make fatigue better), dizziness if your heart rate falls too low, sleep disturbance or mood disturbance. Examples include Carvedilol, Bisoprolol, Metoprolol and Nebivolol.

## – Spironolactone

Spironolactone is a diuretic but it has special properties which help the health of your heart muscle directly by protecting it from a toxic hormone called aldosterone. Spironolactone has been proven to help prolong life and reduce emergency heart problems in people with heart failure if your LVEF is <50%. Spironolactone can cause kidney problems and increase potassium. In men it can cause nipple discomfort and increased breast tissue called gynaecomastia. If this occurs tell your doctor as it can be switched to an alternative called Eplerenone.

## – Entresto (Sacubitril/Valsartan)

Entresto is a new heart failure medication which is a combination of two medications (Valsartan and Sacubitril). Entresto has been proven to help prolong life and reduce emergency heart problems in people with heart failure if your LVEF is less than 40% despite initial treatment with an ACE inhibitor, beta blocker and spironolactone. Side effects include low blood pressure causing dizziness and fatigue, and Entresto can also increase potassium.

## – Dapagliflozin

Dapagliflozin was developed as a diabetes medication but has recently been proven to help treat heart failure, both in people with diabetes and people without diabetes. Dapagliflozin has been proven to help prolong life and reduce emergency heart problems in people with heart failure if your LVEF is less than 40% despite initial treatment with an ACE inhibitor, beta blocker and spironolactone. The main side effect of Dapagliflozin is increased risk of urine infections.

## – Ivabradine

Ivabradine lowers your heart rate and reduces the energy demand on your heart if it is racing fast. It works on your natural pacemaker known as your sinoatrial node. It is only suitable for people in normal heart rhythm called 'sinus rhythm', and does not work if you have an arrhythmia called atrial fibrillation. It is effective if your heart rate is higher than 75 beats per minute when you are sitting quietly.

### iOWNA summary

*When you start your heart failure medication (ACE inhibitor, beta blocker) your doctor will prescribe you a low dose and the doses should be gradually increased over the next weeks. Ask your doctor or nurse if your heart failure medication doses need to be increased or if you have reached the 'target dose' which offers you the most benefit.*

*If your LVEF was <40% when you were diagnosed with heart failure and you are currently taking an ACE inhibitor, beta blocker and spironolactone, ask your doctor if it is time to reassess your heart function with an echocardiogram. If your LVEF has improved to higher than 40% then you should continue on your current medication. If your LVEF is still 40% or less then your heart failure is more resistant to the first medication and you should ask if you are suitable for Entresto, Dapagliflozin, Ivabradine or a Pacemaker.*

## Pacemakers and Defibrillators

In some people heart pacemakers are helpful to treat heart failure.

You may need a pacemaker if:

1. Your heart goes too slowly, or there are long gaps between your heart beats, leading to you feeling dizzy or fainting.
2. Your heart's electrical health has been affected, leading to a delay in the speed in which your heart's electrical system can activate your heart pumping chamber to contract. This is known as a left bundle branch block and if there is a long delay this can be identified on your electrocardiogram (ECG).

If you have heart failure AND your LVEF is 35% or less AND you have left bundle branch block then you may benefit from a specialist cardiac pacemaker.

### iOWNA gem

*If you have heart failure ask your doctor or nurse if you have left bundle branch block. If yes, then ask them to check your LVEF and whether you may benefit from a 'heart failure pacemaker' called a biventricular pacemaker or CRT.*

Heart failure can cause instability of the heart rhythm. If you have severe heart failure there is a risk that your heart may stop suddenly, known as a cardiac arrest. An implantable cardiac defibrillator, known as an ICD, is a specialist type of pacemaker which monitors your heart rhythm. If your heart stops due to a fast rhythm disturbance then the ICD can supply a shock therapy to restart your heart beating.

Defibrillators have been shown to save lives in people with heart failure if your heart weakness is severe (LVEF 35% or less) despite effective medication, and particularly if a heart attack scar is the cause of your heart failure. They have not been proven to help save lives in people with milder heart failure.

## Lifestyle

Heart failure is a chronic condition, which means it requires long-term treatment. You can do lots of things to help control your heart failure in addition to the medication and other treatments.

Managing your medication with a chart or diary can help to control your heart disease; research shows that people with heart failure who take their medication regularly have better control of their heart disease. In addition, starting a weight and blood pressure diary can help your doctor or nurse guide your medication. Show your weight and blood pressure diary to your doctor or nurse at your clinic appointments.

Do's	Don'ts
Manage your medication with a chart or diary to ensure you don't miss a dose	Do not add salt to your food at the dinner table
Start a weight and blood pressure diary, recording them each day	Do not drink too much alcohol as this can place additional strain on your heart muscle
Enrol in a local cardiac rehabilitation programme – ask your GP to refer you	Do not smoke – see your GP to discuss smoking cessation strategies
Exercise is good for your heart, but avoid exercise that causes severe exhaustion	Do not take medications which make heart failure worse

### *iOWNA nugget*



*Did you know that anti-inflammatories and some blood pressure and diabetes medications can make heart failure worse?*

Avoid the following medications which make heart failure worse:

- NSAIDs such as ibuprofen, diclofenac and naproxen
- Calcium channel blockers such as Verapamil, Diltiazem, Amlodipine and Nifedipine
- Saxagliptin (a diabetes medication)
- Diabetes medications called glitazones e.g. Pioglitazone

## Know your iron levels

- Iron deficiency is common in heart failure patients and can contribute to fatigue
- Ask your doctor if your iron levels have been checked recently
- If you have heart failure and your iron levels are low then a dose of intravenous iron is an effective treatment which can improve energy levels

## Know your potassium levels

- Both low and high blood potassium levels can cause heart rhythm disturbances, and low levels can contribute to fatigue
- Low potassium levels are common in people taking diuretics like furosemide
- Low levels can be corrected by increasing potassium-rich foods e.g. bananas, lentils or adding the diuretic amiloride to furosemide
- High potassium levels can be caused by ACE inhibitors, Spironolactone and Entresto
- High levels can be treated by avoiding potassium-containing foods, reducing medication doses, or addition of potassium-binding drugs to allow you to continue to take the higher doses of Spironolactone and ACE inhibitors

More information on how to manage your diet is available at the Heart Failure Matters website: [https://www.heartfailurematters.org/en\\_GB/What-can-you-do/Adjusting-your-diet](https://www.heartfailurematters.org/en_GB/What-can-you-do/Adjusting-your-diet)

### iOWNA gem

*If your weight rises by more than 1.5kg (3.3lbs) in less than 2 weeks then this raises the suspicion your body is accumulating salt and water, particularly if your ankles are swollen, and you need a higher dose of your diuretic. If your weight is falling fast and your ankles have no fluid then you may need to reduce your diuretic dose to avoid dehydration. Ask your doctor or nurse for guidance on how to increase your diuretic dose if your weight rises or falls.*

## Coenzyme Q10

Coenzyme Q10 (CoQ10) is a natural molecule which exists in every cell in our body and has a role in energy metabolism within small cellular structures called mitochondria which are like little batteries of the body. The heart muscle cells are very active and contain many thousands of mitochondria, and are dependent on healthy levels of CoQ10. The concentration of Coenzyme Q10 has been inversely related to the severity of heart failure. Some research suggests that CoQ10 supplementation may help to treat heart failure by improving heart function, increasing ATP production (carrier of energy within cells) and limiting oxidative damage.

One clinical research trial studied the effect of CoQ10 supplementation in 420 patients with heart failure using a specific CoQ10 preparation called Myoquinone (also known as Bio-Ubiquinol, Ubiquinol and Ubiquinone) at a dose of 100mg three times per day. Compared to the individuals with heart failure receiving placebo, those allocated to the Myoquinone treatment had less cardiac emergencies and hospital admissions, their exercise tolerance improved and more survived to a 2-year assessment. Importantly Myoquinone had an acceptable safety profile with few drug interactions and no significant side effects. As well as taking CoQ10 as a supplement, CoQ10 can also be found in some foods, for example: liver, kidney and sardines. Currently a larger definitive trial of Myoquinone is being planned.

## Advanced Heart Failure

Heart failure is a highly variable condition with a wide range of severity. People with milder forms of heart failure can live for many years with their condition well controlled by medication. Other people have a more advanced and severe condition which can lead to emergency admissions to hospital and may be life-limiting.

If you have advanced heart failure and both your health and heart function are still weak despite your heart failure medication and pacemaker therapy, then your specialist will discuss whether you are suitable for advanced heart failure treatments including heart transplantation. It is also appropriate to discuss your condition and your wishes if your health deteriorates with your family and your doctor.

### iOWNA gem

*Ask your doctor how severe and advanced your heart failure condition is. If your doctor confirms your heart failure is severe and advanced then it is helpful to discuss setting up an Advanced Care Directive, so your family, carers and doctors know your wishes.*

## Useful links and references

 [https://www.heartfailurematters.org/en\\_GB](https://www.heartfailurematters.org/en_GB)

 <https://pumpingmarvellous.org/>

 <https://www.bhf.org.uk/informationsupport/conditions/heart-failure>

 [DiNicolantonio, J., Bhutani, J., McCarty, M. and O'Keefe, J. \(2015\). Coenzyme Q10 for the treatment of heart failure: a review of the literature. \*Open Heart\*, 2\(1\)](#)

 [Mortensen, S., Rosenfeldt, F., Kumar, A., Dolliner, P., Filipiak, K., Pella, D., Alehagen, U., Steurer, G. and Littarru, G. \(2014\). The Effect of Coenzyme Q 10 on Morbidity and Mortality in Chronic Heart Failure. \*JACC: Heart Failure\*, 2\(6\), pp.641-649.](#)