

# **Clinical Pathway for the Assessment of Breathlessness (Shortness of Breath)**

## **Introduction**

The main symptom of breathlessness, also described as shortness of breath (SOB), is a common symptomatology in the general population. However from a cardiological point of view breathlessness may denote the failure of the heart to function as a pump. Therefore it is important to rule out heart failure in the breathless patient.

Heart failure is however a complex clinical syndrome of symptoms, signs and objective evidence of heart pump failure. Numerous classifications have been used to define heart failure but commonly, it is either classified as systolic dysfunction or diastolic dysfunction.

In the UK nearly 900,000 people have heart failure and almost as many have damaged hearts but are yet to present with symptoms or signs of heart failure. Both the incidence and prevalence of heart failure increases with advancing age and it is expected that the prevalence of heart failure will increase in the UK with advancing age due to better survival rates and also due to improved treatments for coronary artery disease and hypertension. However heart failure carries a poor prognosis and therefore survival is best determined by early diagnosis and treatment.

A GP on an average will look after about 30 patients with heart failure and there will be a suspicion for a new diagnosis of heart failure in about 10 patients per annum.

It is therefore of paramount importance that heart failure is suspected, identified, diagnosed and treated early. This document has been produced based on the current recommendations from NICE, The European Society Guidelines and also from the Focused Update from The American College of Cardiology. This document is not a full descriptive manuscript however it will help in the management of suspected heart failure cases in the community and primary care and to determine who benefits most from a specialist referral.

## **Main Symptoms of Heart Failure**

### **1. Breathlessness or otherwise known as shortness of breath**

The term shortness of breath is a common symptomatology where patients describe difficulty in getting their breath and in some way they express this when breathing becomes uncomfortable or unpleasant. It is important to distinguish between breathlessness and the usual increased rate of respiration that occurs with exertion such as with exercise and to note that those who develop breathlessness or SOB due to heart failure typically describe their breathing pattern as uncomfortable or unpleasant. Two most important causes of breathlessness on exertion are associated with cardiac disease and respiratory disease but sometimes breathlessness may also be related to other causes as given in box 1

### **2. Orthopnoea**

This is where patients describe an unpleasant or uncomfortable feeling when they try to lay flat or the necessity to sit upright or sit propped up in bed for more comfortable breathing. It is important to recognise that patients with heart failure typically describe orthopnoea when they have slipped down to a flat position in bed after having gone to bed in the propped up position. However if a patient sleeps

propped up but has a history to suggest they may have slipped down flat and had a comfortable sleep throughout the night, the patient is unlikely to be describing orthopnoea.

Orthopnoea may also be due to other reasons such as decubitus angina or gastroesophageal reflux, lung disease, obesity, anxiety, pregnancy or it may be a habit to sleep propped up.

### **3. Paroxysmal nocturnal dyspnoea**

This is a more common serious symptom and history should be taken carefully to distinguish this from orthopnoea. Classical teaching is described whereby a patient wakes up in the middle of the night after having slept for a few hours feeling extremely breathless, uncomfortable and the need to get out of bed, stand up and go to the closest window to get fresh air. Paroxysmal nocturnal dyspnoea is a very significant symptom to strongly suggest cardiac dysfunction. However PND can also be rarely associated in cases of nocturnal asthma.

### **4. Tiredness and fatigability**

Although tiredness and fatigability are non specific symptoms and are generally common in the population, this could however be a symptom of reduced cardiac output, especially after having done a certain degree of exertion whereby there is fatigability of muscles and the patient describes vague symptoms of generally feeling tired. One should definitely take note of this symptom if they are known to have pre-existing heart disease that could contribute to cardiac dysfunction.

### **5. Swelling of ankles**

Swelling of ankles is usually a clinical sign however a patient may also describe that they have noticed that their feet/ankles tend to swell and in heart failure it is usually seen to be more noticeable towards the evening. One must however keep in mind other causes of leg swelling, especially when it occurs in isolation as given in Box 2.

## **Clinical Signs**

The clinical signs to look for are:

1. An increase in heart rate (tachycardia more than 100, especially at rest)
2. Resting tachypnoea with respiratory weights created at 20
3. Bilateral ankle swelling or pedal oedema
4. Raised jugular venous pressure of greater than 3cm taken from the angle of Louis at 45° patient elevation
5. The presence of a third or fourth heart sound
6. Hepatomegaly which is usually tender
7. Ascites
8. The presence of bilateral pulmonary basal crackles

### **Special Group**

However special note must be taken of those patients who complain of breathlessness with associated anginal type chest pains (i.e. chest pains brought on with exertion) as they are a very high risk group of patients who probably have ischaemia induced left ventricular dysfunction who will require an urgent referral to a specialist or a Rapid Access Chest Pain Assessment Unit for further tests and investigations.

## Patients who are deemed at high risk

1. History of previous myocardial infarction
2. Proven on known coronary artery disease
3. Hypertension
4. Arrhythmia (especially tachyarrhythmia such as atrial fibrillation)
5. Known moderate to severe valvular heart disease
6. Known cardiomyopathy of any cause
7. Diabetics

### Box 1

Causes of breathlessness other than that due to heart failure:

1. Obesity
2. Poor exercise effort tolerance
3. Respiratory causes (COPD, Asthma)
4. Thoracic cage abnormalities

### Box 2

Causes of swelling of feet other than heart failure (swelling of feet with no other clinical evidence for heart failure):

1. Gravitational oedema
2. Venous oedema secondary to poor venous valves
3. Drugs (especially calcium channel blockers, nitrates and non steroidal)
4. Hypoalbuminemia
5. Rarely pelvic and abdominal pathology

### Box 3

Drugs that precipitate or exacerbate heart failure:

1. Non steroidal
2. Steroids
3. Lithium
4. Anti-arrhythmic drugs such as class 1C drugs for example Flecainide. Other drugs including beta blockers, calcium channel blockers (Nifedipine, Verapamil and Diltiazem).
5. Cytotoxic drugs

## Box 4

### Monitoring Renal Functions

1. Check Baseline U&Es
2. Re-check 1-2 weeks after initiating therapy
3. Re-check 1 and 4 weeks after each dose up-titration
4. Re-check U&Es once maintenance dose is achieved at 1, 3, and 6 months and then 6 monthly thereafter

## Box 5

### Serum Natriuretic Peptides

#### High levels

BNP > 400pg/ml (116pmol/litre)

NTpro BNP > 200pg/ml (236pmol/litre)

#### Raised levels

BNP 100-400pg/ml (29-116pmol/litre)

NTpro BNT 400-2000pg/ml (47-236pmol/litre)

#### Normal levels

BNP < 100pg/ml (29pmol/litre)

NTpro BNP < 400pg/ml (<47pmol/litre)

## Box 6 (Caution)

#### Low levels

Obesity, diuretics, ACE inhibitors, beta-blockers, ARBs and aldosterone antagonist can reduce levels.

#### High levels other than due to heart failure

LVH, ischaemia, tachycardia, RV overload, hypoxaemia (including pulmonary embolism) GFR < 60ml/minute, sepsis, COPD, diabetes, age > 70 years and liver cirrhosis.

## **Detect associated co-morbidities that could precipitate heart failure**

### **Non cardiovascular**

1. Anaemia
2. Pulmonary disease
3. Renal dysfunction
4. Thyroid dysfunction
5. Diabetes

### **Cardiovascular causes**

1. Ischaemia
2. Hypertension
3. Valvular dysfunction
4. Diastolic dysfunction
5. Atrial fibrillation
6. Ventricular dysrhythmias and bradyarrhythmias

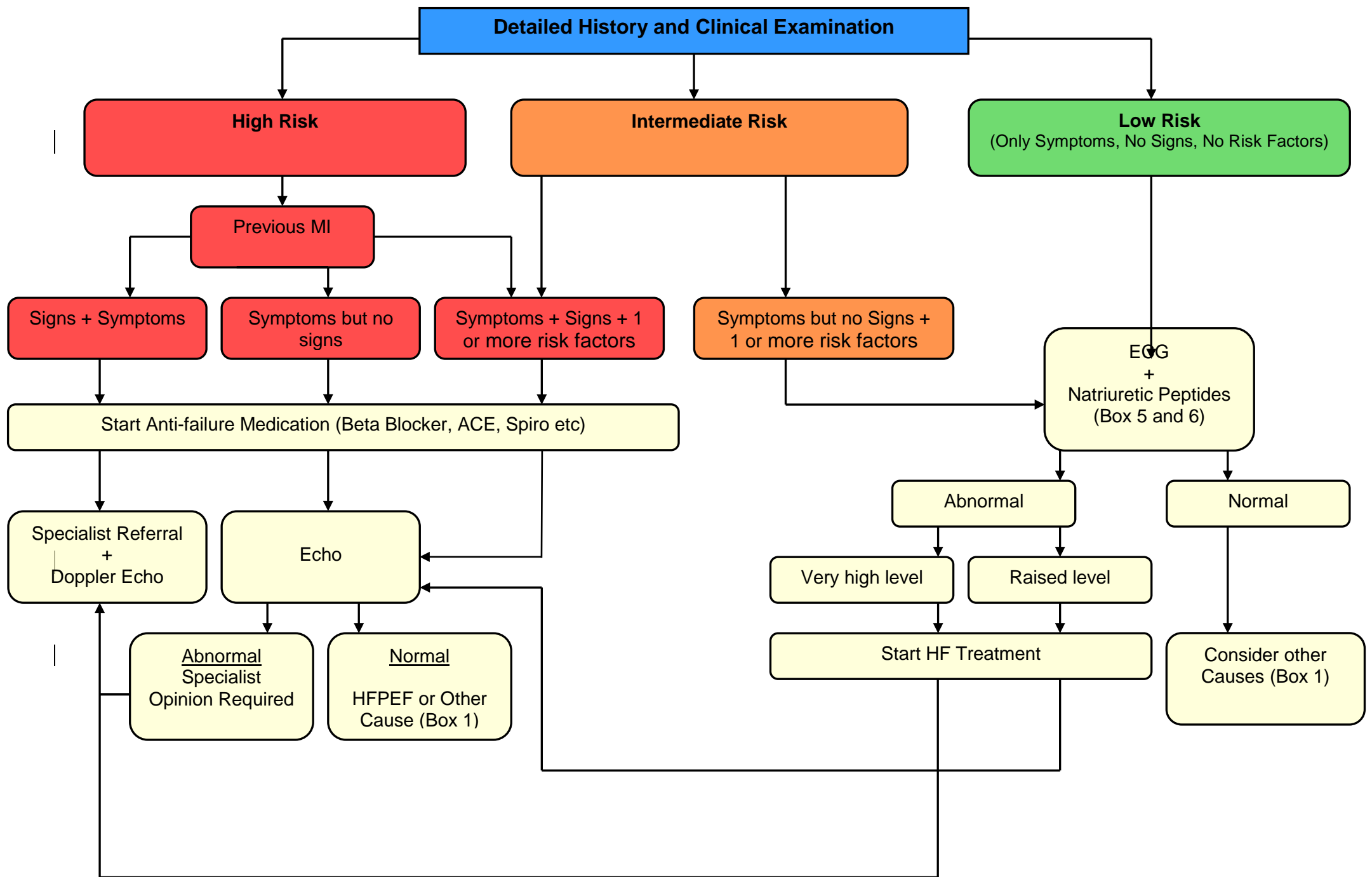
## **Special Attention**

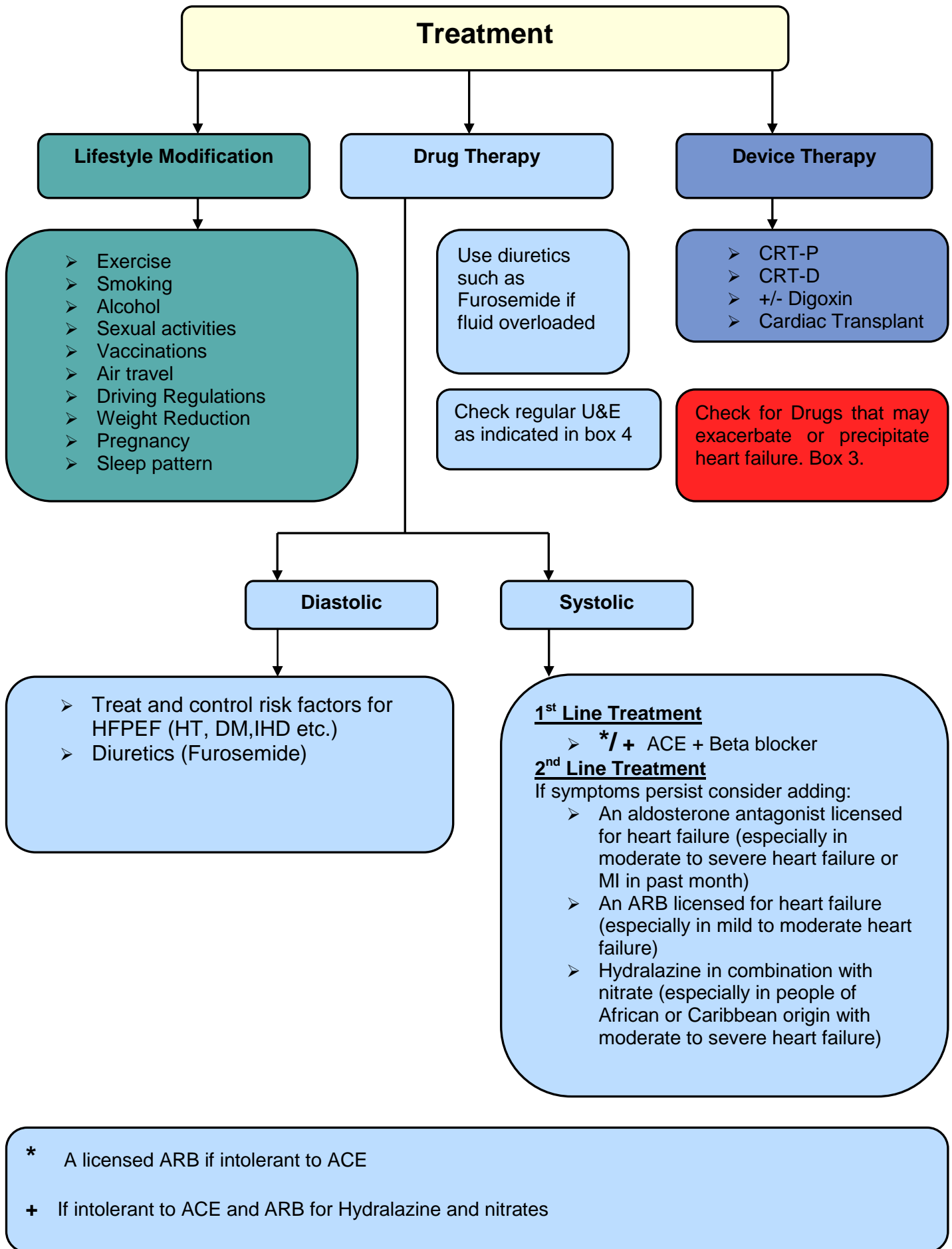
### **When to refer for an echo**

- Raised BNP levels
- Symptoms + signs + 1 or more risk factors
- Previous MI with symptoms + no clinical signs of HF

### **When to refer for a specialist opinion**

- Very high levels of natriuretic peptides
- Abnormal echo
- Previous MI with symptoms + signs of heart failure





## References

1. Management of chronic heart failure in adults in primary and secondary care. NICE clinical guideline; August 2010
2. 2009 Focused Update: ACC/AHA Guidelines for the Diagnosis and Management of Heart Failure in Adults; Circulation 2009
3. ESC guidelines for diagnosis and treatment of acute and chronic heart failure 2008; European Heart Journal ; 2008