

## Prescribing Beta-blocker for patients with heart failure due to left ventricular systolic dysfunction

Beta-blockers reduce mortality (by about 30%) and hospital admissions (by about 20%) when included as part of standard heart failure therapy, including ACE inhibitor treatment. In line with NICE guidance, beta-blockers licensed for heart failure should be offered to all patients with heart failure due to left ventricular systolic dysfunction (ejection fraction (EF)  $\leq$  40%).

### UK Licensed beta blockers for heart failure

- **Bisoprolol** – adjunct in stable moderate to severe heart failure with reduced systolic ventricular function (EF  $\leq$  35% on echo). Bisoprolol is cardioselective and therefore should be the preferred agent if beta-blockers are used in patients with respiratory problems.
- **Carvedilol** – used as an adjunct to diuretics, digoxin or ACE inhibitors in symptomatic chronic heart failure. Carvedilol may be more effective at reducing hypertension. Note: Carvedilol should be prescribed twice daily for heart failure.
- **Nebivolol** – adjunct in stable mild to moderate heart failure in patients over 70 years. Nebivolol has vasodilating properties which may be useful in treating hypertension.

NICE recommends that patients who are already taking a beta-blocker for a comorbidity (for example, angina or hypertension), and who develop heart failure due to left ventricular systolic dysfunction, should be switched to a beta-blocker licensed for heart failure.

**In South London, bisoprolol is the preferred agent, with carvedilol a suitable second-line alternative.**

Contraindications	Cautions
<ul style="list-style-type: none"> <li>• Severe bronchial asthma or COPD with reversibility</li> <li>• Uncontrolled/acute heart failure / decompensated heart failure / symptoms of fluid retention in the past 6 weeks</li> <li>• Prinzmetal's angina</li> <li>• Sinus bradycardia &lt;50bpm</li> <li>• Sick sinus syndrome including sino-atrial block, second or third degree heart block (without a pacemaker)</li> <li>• Hypotension – (systolic blood pressure &lt;90mmHg) or symptomatic hypotension)</li> <li>• Cardiogenic shock</li> <li>• Metabolic acidosis</li> <li>• Severe peripheral circulatory disturbances/peripheral arterial disease</li> <li>• Pheochromocytoma (apart from specific use with <math>\alpha</math>blockers)</li> <li>• Hypersensitivity to beta-blockers or any of the excipients</li> <li>• Patients treated with verapamil</li> </ul>	<ul style="list-style-type: none"> <li>• Mild to moderate reversible airways disease – monitor peak flow prior to and following initiation and after any dose change. If concerned, seek specialist advice prior to initiation</li> <li>• Renal or hepatic disease (see BNF for further details)</li> <li>• Beta-blockers may mask early signs of hypoglycaemia, Worsening control of blood glucose may occur. Additional monitoring is therefore necessary in patients with diabetes when beta-blockers are initiated and during dose titration phase, especially in unstable diabetes and in patients on insulin</li> <li>• First degree heart block</li> <li>• Use of concomitant medication that may increase the risk of bradycardia</li> </ul>

**Beta-blocker therapy should not be withheld for any of the following reasons: increasing age, presence of peripheral vascular disease, erectile dysfunction, diabetes mellitus, interstitial pulmonary disease and chronic obstructive pulmonary disease (COPD) without reversibility.**

### Initiation and dose titration

Treatment should be initiated and titrated by those experienced in the management of heart failure.

- Introduce beta-blockers in a 'start low, go slow' manner.
- Ensure the patient is symptomatically stable and other heart failure therapies have been mainly unchanged for 2 weeks.
- Doses should be increased according to the dose titration schedule below as long as the patient is clinically stable.

### Suggested dose titration schedule:

Drug	Week 0	Week 4	Week 8	Week 12	Week 16	Week 20
<b>Bisoprolol</b>	1.25mg od	2.5mg od	3.75mg od	5mg od	7.5mg od	10mg od
<b>Carvedilol</b>	3.125mg bd	6.25mg bd	12.5mg bd	25mg bd*	50mg bd**	
<b>Nebivolol***</b>	1.25mg od	2.5mg od	5mg od	10mg od		

\*maximum dose in patients with severe heart failure or body weight <85kg

\*\*maximum dose for those with body weight  $\geq$ 85kg

\*\*\*Nebivolol is only available in 5mg tablets, which complicates the initiation and dose titration process

- Aim for the target dose as detailed above. Failing that, aim for the maximum tolerated dose. **Some beta-blocker is better than no beta-blocker.**
- Monitor heart rate, blood pressure, clinical status, symptoms and signs of congestion e.g. body weight, breathlessness and oedema within 1-2 weeks of initiation or dose titration. An ECG is recommended before initiation in patients with a heart rate less than 60 beats per minute.
- Check blood electrolytes, serum urea and creatinine 1-2 weeks after initiation and 1-2 weeks after final dose titration.

**IMPORTANT: If a beta-blocker has been stopped for more than 2 weeks, re-introduce cautiously. Consider re-starting from the initiation dose.**

Patients switching from another beta-blocker to one licensed for use in heart failure do not usually require re-starting from the initiation dose. Start at an equivalent point within the dose range depending on clinical status and monitor closely.

### Problem solving

**Worsening symptoms/signs** (e.g. increasing dyspnoea, fatigue, oedema, weight gain >1.5kg over 3days)

- If increased congestion, double dose of diuretic and/or halve dose of beta-blocker (if increasing diuretic does not work).
- If marked fatigue (and/or bradycardia, see below) halve dose of beta blocker (rarely necessary).
- Review patient in 1-2 weeks. If there has been no improvement, seek specialist advice.
- If serious deterioration, halve the dose of beta-blocker or stop treatment (rarely necessary) and seek specialist advice.
- If there are worsening symptoms of airways disease, stop the beta-blocker and seek specialist advice.

### Asymptomatic hypotension

- Does not usually warrant a change in therapy.

### Symptomatic hypotension

- If combined with dizziness, light-headedness or confusion, consider discontinuing drugs such as nitrates, calcium channel blockers and other vasodilators.
- If no signs/symptoms of congestion, consider reducing dose of diuretic.
- If these measures do not solve problem, seek specialist advice.

### Bradycardia (HR<55)

- If bradycardia and worsening symptoms, halve the dose of beta-blocker or if severe deterioration, stop beta-blocker (rarely necessary).
- Consider need to continue treatment with other drugs used to slow the heart (digoxin, amiodarone, diltiazem) and discontinue if co-morbidities allow. Consider referral if in doubt.
- Arrange ECG to exclude heart block.
- Seek specialist advice.

### 2<sup>nd</sup> or 3<sup>rd</sup> degree heart block

- Stop beta-blocker and consult immediate specialist advice from secondary care (patient may require hospital admission).
- Undertake a further ECG after beta-blocker stopped.

### Impotence

- Discuss with patient and doctor. This may resolve as heart failure improves although a referral to the erectile dysfunction clinic should be offered.

### Information for patients

- This treatment is given to prevent worsening of heart failure, improve day to day symptoms, reduce risk of hospital admission and prolong life.
- It may take a few weeks or even months for symptoms to significantly improve after starting therapy.
- A temporary deterioration in symptoms can occur after this drug is started or after a dose increase (this is expected in about one third of patients). Any increase in fatigue, breathlessness and / or tiredness which is severe, or persists for more than a few days, should be reported to your doctor or heart failure team. These symptoms can usually be managed by adjusting other medicines. **Please do not stop your beta-blocker therapy without speaking to your GP or heart failure team.**
- You are advised to weigh yourself daily (after waking and first use of the toilet but before breakfast and dressing) and to consult your GP or heart failure team if you notice a progressive increase in weight (e.g. by 3-4 pounds (1.5kg) or more over 3 – 4 days).
- Carvedilol should be taken with food.

**IMPORTANT: Beta-blockers should not be stopped suddenly unless absolutely necessary due to the rebound effects (increased myocardial ischaemia / risk of infarction and arrhythmias). Specialist advice should be sought before treatment discontinuation.**

### References

- [Chronic Heart Failure: NICE clinical Guideline CG108](#). Issued Aug 2010
- [ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure 2012](#).

Acknowledgments to Northampton General, Kings College and St George's Hospitals & Gloucestershire Countrywide Primary Care Heart Failure Guidelines.