NHS
Nottinghamshire Area Prescribing Committee

# Nottinghamshire Heart Failure Traffic Light Guidelines

## Red – Cardiology Care

## Amber – Care shared

## Green – Primary Care/Non specialist

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# The Heart Failure Nottinghamshire Lights

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**Scope and Purpose**
The purpose of the Heart Failure Nottinghamshire Lights is to provide local clinical and service guidance for General Practitioners and practice-based staff on the management of people diagnosed with heart failure. The Heart Failure Nottinghamshire Lights supports the QIPP workstream on the integrated care pathway for heart failure with recommended quality markers developed by the Nottinghamshire Coronary Heart Disease Network Heart Failure Group based on clinical evidence.

The Nottinghamshire Heart Failure Lights denote the colours Green, Amber and Red which indicates the clinical/therapeutic and service classification of patients'/carers journey along and between an integrated care pathway for heart failure and recommendations for treating heart failure (NICE 2018). The heart failure traffic light classification is a simple means of classifying patients into the various potential health sectors delivering heart failure, recognising that patients will move between the different sectors at different stages of their journey.

**PATIENTS MAY BE REFERRED DIRECTLY TO HEART FAILURE CLINICS AT NUH OR SFH**

GREEN – defines patients with a CONFIRMED aetiological diagnosis and clinically stable and/or no unscheduled heart failure admissions in previous 6 months and on baseline medical therapy. Baseline medical therapy is defined by NICE and includes ACE inhibitors, beta blockers and diuretics. In patients intolerant of ACE inhibitors Angiotensin II receptor blockers (ARBs) are considered an alternative.

GREEN PATIENTS MAY BE MANAGED IN PRIMARY CARE BUT CONSIDER REFERRAL TO A SPECIALIST FOR CONFIRMATION OF AETIOLOGY.

AMBER – classify if clinically unstable patient and/or 1-2 unscheduled admissions in previous 6 months and taking intermediate medical therapy. Intermediate medical therapy will include patients intolerant of baseline therapy and those requiring spironolactone or eplerenone in addition to baseline treatments. Ivabradine requires consideration in patients in sinus rhythm with heart rate > 75 bts/minute and ejection fraction <35% despite treatment with beta blockers and optimal baseline therapy. Ivabradine may also be considered in patients intolerant of or unable to take betablockers. Consider cessation of ACE inhibitors or ARB and switch to sacubitril/valsartan (Entresto®) in patients with LVEF<35% who remain symptomatic (NYHA II-IV). Consider dapagliflozin as an adjunct to standard therapy for patients who remain symptomatic on optimised standard care.

AMBER PATIENTS WILL USUALLY NEED A COMBINED CARE APPROACH BETWEEN PRIMARY AND SPECIALIST CARE. THIS MAY INVOLVE THE HEART FAILURE MULTI-DISCIPLINARY TEAM WITH THE SUPPORT OF SPECIALIST HEART FAILURE NURSES.

RED – classify if clinically unstable patient and/or more then 2 unscheduled heart failure admissions in the previous 6 months on advanced medical therapy. Advanced medical therapy consists of either digoxin (particularly for patients in AF) and/or an ARB and/or prescribed metolazone or bendroflumethiazide therapy added to baseline/intermediate therapy.

RED PATIENTS SHOULD BE CONSIDERED FOR REFERRAL TO CONSIDER PALLIATIVE OR ADVANCED STRATEGIES E.G. BIVENTRICULAR PACING, DEFIBRILLATOR

| CLINICAL / THERAPEUTIC CLASSIFICATION | SERVICE CLASSIFICATION |
|---|---|
| **Green**<br>**CLINICAL**<br>Stable with diagnosis confirmed by Echo, and/or no unplanned HF admissions in the previous 6 months<br>**THERAPY**<br>Baseline therapy:<br>• ACE or ARB if ACE intolerant or Hydralazine with nitrate if ACE and ARB intolerance.<br>• Beta-blocker<br>• Diuretic (if fluid retention) | Open Access Echocardiogram ↔ Primary Care ↔ Specialist Nurse |
| **Amber**<br>**CLINICAL**<br>Unstable and/or 1-2 unplanned HF admissions in the previous 6 months<br>**THERAPY**<br>Intermediate therapy:<br>• Failed baseline therapy or<br>• On-going baseline therapy AND spironolactone or eplerenone added<br>• Consider addition of ivabradine for patients in sinus rhythm, HR >75 beats per minute and ejection fraction <35%<br>• Consider sacubitril/valsartan (Entresto®)<br>• Consider dapagliflozin | General Medical or Cardiology Clinics<br>Inpatient Decompensated HF<br>→ **HF Multidisciplinary Team**<br>• Integrated HF Service<br>• Cardiology Consultants<br>• HF Specialist Nurses<br>• Health Care of the Elderly Physicians<br>• Pharmacist Support<br>← Diagnosis for planning of Management & periodic review<br>← HF Clinics follow up +/- HF specialist nurse |
| **Red**<br>**CLINICAL**<br>Unstable and/or 2 unplanned HF admissions in the previous 6 months, advanced care or palliation to be considered<br>**THERAPY**<br>Advanced therapy:<br>• Addition of digoxin if AF or on-going symptoms despite intermediate therapy<br>• Addition of ARB to intermediate therapy<br>• Thiazide therapy required in addition to loop diuretics | **Palliative Therapy Multidisciplinary Team**<br>• Cardiologist<br>• GP<br>• HF Specialist Nurses<br>• Community Nurses<br>• Patient & Carers<br>↔ **Advanced Heart Failure team** |

# Diagnosing heart failure (1)



Detailed history and a clinical examination lead to suspicion of heart failure

**Assessment of probability**

1. **Clinical History - 4 features**
   - History of CAD (MI, PCI, CABG)
   - Hypertension
   - Use of diuretics
   - SOB—orthopnoea and PND
2. **Physical Examination-4 findings**
   - Crepitations
   - Bilateral ankle oedema
   - Heart murmur and/or displaced apex beat
   - Elevated JVP
3. **ECG-Any abnormality but especially the following 4:**
   - Previous MI or IHD
   - LVH
   - AF
   - Bundle branch block (especially left)

**Cardiac causes of elevated Brain Natriuretic Peptide (BNP)**

- Heart failure
- ACS
- PE
- Myocarditis
- LVH
- Hypertrophic/restrictive CM
- Valvular heart disease
- Congenital heart disease
- Arrhythmias
- Cardioversion
- ICD shock
- Post cardiac surgery

**Non cardiac causes of elevated BNP**

- Elderly
- Ischaemic stroke
- Subarachnoid bleed
- Renal dysfunction
- Liver impairment
- COPD
- Severe infection
- Severe burns
- Anaemia
- Metabolic— Diabetes (DKA)
- Thyrotoxicosis

**Brain natriuretic peptides BNP (NTproBNP)**

**High Levels** – **>400** (2000) pg/ml
**Raised levels** — **≥100-400** (400-2000) pg/ml
**Normal levels** – < **100** (400) pg/ml

**any of the above present**

All absent

Heart Failure unlikely, consider other diagnosis

**Initial investigations — BNP, CXR,**
**Bloods** - FBC, U&E (GFR), LFTs, Thyroid function, Lipids, Glucose (HbA1c), Ferritin, TIBC

Abnormal **BNP** levels high or raised

Normal BNP levels

**HF with PRESERVED (or midrange) EJECTION FRACTION LVEF>40% (HFpEF and HFmEF)**

Diastolic impairment
Dilated atria/ ventricles
LVEF >40%

Echocardiogram

**No echocardiographic abnormality**

Manage comorbidities- BP, CAD and diabetes
Consider referring to cardiology if aetiology unclear (especially age <65years) and/or symptoms persist
**see diagnosing heart failure (2)**

**HF with REDUCED EJECTION FRACTION (HFrEF) - LVEF ≤40%**
**Determine aetiology and start treatment**
**Consider urgent cardiology referral if BNP >400**

Valve disease or other structural abnormality

Cardiology referral

# Diagnosing heart failure (2) — Diastolic dysfunction

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Suspect heart failure with **PRESERVED** (or mid range) **EJECTION FRACTION**

## Causes of HFpEF and diastolic heart failure

- Age
- Hypertension
- Diabetes
- Obesity
- CKD
- Coronary heart disease
- AF
- Right heart failure secondary to lung disease
- Valvular heart disease
- HCM
- Infiltration eg amyloid
- Restrictive CM
- Constrictive pericarditis
- Genetic eg Fabrys
- Reverse remodelling in patients with previous HFrEF

## Diagnosis*

**1. Symptoms and signs of cardiac failure**

**2. LVEF >40%**

**3. Elevated BNP> 100pg/ml ***

**4. AND at least one additional criterion:**

**a) Relevant structural heart disease (LVH, dilated atrium)**
**b) Diastolic dysfunction reported on echo**

***Normal BNP means HF unlikely but does not completely exclude the diagnosis**

## Heart failure definition

**Heart Failure with**
**-Reduced ejection fraction (HFrEF) - LVEF<40%**
**-Mid-range ejection fraction (HFmEF) - LVEF 40- 49%**
**-Preserved ejection fraction (HFpEF) - LVEF>50%**

HFpEF refers to patients with-LVEF>50%. Diuretics and comorbidity management are the mainstay of treatment.

ESC guidelines also classify ejection fraction into mid-range -HFmEF with LVEF 41-49%.
Diuretics and comorbidity treatment remains first line for this patient group but some may also benefit from treatment with ACE (or ARB) and/or beta blockers.
Consider cardiology review in younger patients (<65yrs) or if diagnosis unclear.

**Diagnosis confirmed**

**DIURETICS**
(low to medium dose—see heart failure medication summary)
AND
**FLUID MANAGEMENT**
Optimise and treat **REVERSIBLE** contributory pathology

Confirm dry /target weight
Fluid log
Teach diuretic self titration on patient's own weighing scales

## Increase diuretic (by one titration step*)

- Increase in daily weights >2kg over 2 days
- Increased breathlessness
- Increased oedema

***One titration step = 40mg furosemide or 1mg bumetanide**

## Decrease diuretic (one titration step*)

- Decrease in daily weight to < 1kg of dry weight maintained over 2 days
- No breathlessness for 4/52**
- No oedema for 4/52**
- Symptoms of dehydration (eg thirst, dizziness, hypotension)

***One titration step = 40mg furosemide or 1mg bumetanide**
** Aim to reduce dose by one titration step if stable symptoms

## Cardiology Review /Discussion

- **Refractory symptoms**
- **Increasing severity of symptoms**
- **Thiazide/ IV diuretics to be considered under specialist supervision.**

# Treatment of Chronic Heart Failure

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Heart failure

Heart failure with LVEF>40% includes **HFpEF and HFmEF**

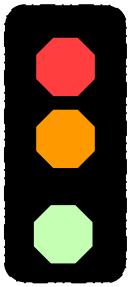
**DIURETICS**
- Mainstay of therapy
**Treat comorbidities**
BP, CAD, Obesity and Diabetes in keeping with NICE guidance

Heart failure due to left ventricular systolic dysfunction **(HFrEF) - EF<40%**

**First line treatment**

Offer both an:

- **ACE INHIBITOR** licensed for heart failure
  - ⇒ Consider an **ARB** if patient is intolerant to an ACE inhibitor
  - ⇒ Consider hydralazine with a nitrate if intolerant to ACE or ARB
- And a **BETA BLOCKER** licensed for heart failure
- Also, consider **LOOP DIURETICS** for symptomatic relief of



**KEY: Traffic Lights**

**Advanced/Palliative**

**Intermediate Therapy**

**Baseline Therapy**

**Drug Therapy Titration steps**

**Month 1-** ACE, Beta blocker ± Diuretic
**Month 2**- Add spironolactone or eplerenone
**Month 3**- Add ivabradine
**Month 4-** Consider dapagliflozin/ Entresto®

Offer personal exercise based rehabilitation and education

If symptoms **PERSIST** despite stable first-line treatment **SEEK SPECIALIST ADVICE** and consider second-line treatment .

**Second line treatments for consideration of adding to current therapy in patients with LVEF<35%:**

- **SPIRONOLACTONE** or second line **EPLERENONE** (especially in moderate to severe heart failure or MI in the past month)
- **IVABRADINE** (only for patients in sinus rhythm, HR>75 beats per minute, and in combination with standard therapy including beta-blocker therapy, ACE inhibitors and aldosterone antagonists and ejection fraction <35% or where beta-blockers are contraindicated or not tolerated)
- Consider **DAPAGLIFLOZIN**
- Consider cessation of ACE inhibitors or ARB and switch to **SACUBITRIL-VALSARTAN (ENTRESTO®)** in patients with LVEF<35% who remain symptomatic (NYHA II-IV) despite taking a stable dose of ACE inhibitor or ARB.
- Add **HYDRALAZINE WITH A NITRATE**

**If symptoms persist despite 2 /12 of optimal therapy consider:**

- **Biventricular pacing** (CRT especially if LBBB and /or QRS>130msec ) or **ICD** when LVEF<35% where appropriate
- **Digoxin** (in patients with AF)
- **Thiazide diuretics**
- Revascularisation/Transplant / left ventricular assist device

**If symptoms despite advanced therapies consider:**

- **Palliative Care**

## ACE Inhibitors

All patients with HFrEF should receive an ACE inhibitor unless contraindicated. Target Dose — titrated at intervals of at least two weeks until target dose is reached or until significant side effects occur (in which case, maximum tolerated dose should be maintained).

| Medicine | Dosage Increments | Target Dose |
|---|---|---|
| Ramipril | 1.25mg OD; 2.5mg OD; 5mg OD; 10mg OD | 10mg a day |
| Perindopril | 2mg OD; 4mg OD | 4mg a day |
| Lisinopril | 2.5mg OD; 5mg OD; 10mg OD; 15mg OD; 20mg OD; 30mg OD; 35mg OD | 35mg a day |
| Enalapril | 2.5mg BD; 5mg BD; 10mg BD; 15mg BD; 20mg BD | 10 - 20mg BD |

NB. Potassium sparing diuretic should be stopped and substituted with a loop diuretic if appropriate prior to initiating an ACE inhibitor.
**Monitor U&Es, creatinine and BP prior to each dose increase.**

## Angiotensin II Receptor Blocker (ARB)

Some ARBs are licensed as an alternative to ACE inhibitors, where the patient has to discontinue ACE inhibitors because of persistent cough. **Only to be used when the patient is intolerant of ACE Inhibitors**

| Medicine | Dosage Increments | Target Dose |
|---|---|---|
| Losartan | 12.5mg OD; 25mg OD; 50mg OD | 150mg OD |
| Candesartan | 4mg OD; 8mg OD; 16mg OD; 32mg OD | 32mg OD |

**Monitor U&Es, creatinine and BP prior to each dose increase.**

## Loop Diuretics

Indicated in patients with signs and symptoms of decompensating heart failure, such as evidence of oedema, worsening breathlessness, orthopnoea or paroxysmal nocturnal dyspnoea. **AIM FOR MINIMUM MAINTENANCE DOSE**

Target doses for loop diuretics
Patients' signs and symptoms should be reviewed three days after the dose is

| Increasing Furosemide | |
|---|---|
| Current dose: | Increase to: |
| 40mg OD | 80mg OD |
| 80mg OD | 120mg (80mg am; 40mg pm) |
| 120mg (80mg am; 40mg pm) | 160mg (80mg BD) Consider initiating Spironolactone / Metolazone if symptoms persist. |

| Increasing Bumetanide | |
|---|---|
| Current dose: | Increase to: |
| 1mg OD | 2mg OD |
| 2mg OD | 3mg (2mg am; 1mg pm) |
| 3mg (2mg am; 1mg pm) | 4mg (2mg am; 2mg pm) Consider initiating Spironolactone / Metolazone if symptoms persist. |

increased or decreased and if the dose is sustained U+Es checked thereafter.

**An increase in diuretic should be considered when:**

- Increase in daily weights of ≥2kg (approximately 4lbs) over 2-3 days
- Increased dyspnoea.
- Increased oedema.

**A decrease in diuretic should be considered when:**

- Decrease in daily weight to 1kg less than dry weight sustained over 2/3days.
- No symptoms of dyspnoea
- No oedema
- Symptoms of dehydration (eg thirst, dizziness, hypotension).

## Beta-adrenoceptor antagonists (Beta-blockers)

All patients with LVSD should receive a beta blocker unless contraindicated. NB Baseline ECG must be available prior to initiation of beta-blocker to exclude atrioventicular conduction delay (heart block). Based on ECG, further discussion with Cardiologist may be required.

**Before starting or titrating beta-blockers check the following**: -

- Pulse ≥ 60 bpm
- BP - systolic pressure ≥ 100mmHg
- Patient is not asthmatic (use with caution)
- Diabetic status – must be stable
- Exclude symptomatic hypotension
- Exclude increased oedema
- Observe for any increase in breathlessness

**Renal Function (U & Es) to be checked 1-2 weeks after initiation and 1-2 weeks after final dose titration**

| Medicine | Dosage Increments | Target Dose |
|---|---|---|
| Bisoprolol | 1.25mg OD; 2.5mg OD; 3.75 mg OD; 5mg OD;7.5 mg OD; 10mg OD | 10mg OD |
| Carvedilol* (second line) | 3.125 mg BD; 6.25 mg BD; 12.5 mg BD;25 mg BD (body weight <85 kg); 50 mg BD (body weight > 85 kg) | 25mg BD or 50 mg BD (depending on body weight) |

**Titration rates for Beta-blockers**

Titration rate can be reduced to a minimum of 1-2 weeks with close monitoring

*Carvedilol: Max 25mg BD in patients with severe HF or body weight <85kg. In mild to moderate HF— max 50mg BD in patients with a body weight of >85kg.

Aim for target or highest tolerated dose. Warn patients of the potential side effects of beta-blockers, and the possibility of temporary deterioration of symptoms following initiation and titration. Advise patients not to stop taking a beta-blocker without consulting their doctor/ specialist nurse.

## Aldosterone Antagonists

**Spironolactone**

Indicated in those patients with ongoing symptoms (NYHA II -IV) despite other medical therapy. Before initiating spironolactone any potassium supplements should be discontinued.

**Eplerenone — second line aldosterone antagonist if spironolactone is not tolerated**

Eplerenone has evidence of benefit in patients with LVSD post myocardial infarction if started within 3-14 days of MI, in a secondary care setting. Patients with CHF in NYHA II-IV may also benefit from aldosterone antagonism with eplerenone (EMPHASIS 2011).

| Medicine | Dose | Dosage Increments |
|---|---|---|
| Spironolactone | 25 mg OD | Can be increased under specialist guidance |
| Eplerenone | 25 mg OD | Should be titrated to 50mg OD within 4 weeks if appropriate (BNF, 2010) |

Monitoring for patients taking aldosterone antagonists.

**Renal function and potassium to be rechecked after:**

- **1 week**
- **4 weeks**
- **8 weeks**
- **12 weeks**
- **3 monthly for the first year**
- **6 monthly thereafter**

**Actions required based on monitoring show in table opposite**

| Criteria for review or discontinuation | Recommended action |
|---|---|
| K+ ≥ 6.0 mmols/L | Discontinue aldosterone antagonist |
| K+ 5.5-5.9 mmol/L or creatinine to >200 µmol | Decrease aldosterone antagonist to 25mg alternate days |
| Diarrhoea, vomiting, gynaecomastia | Review treatment and seek advice from GP or cardiologist |
| Urea increases to ≥ 18 mmol/L or by 50% from baseline | |

# Heart Failure Medication Summary - for use with Nottinghamshire Heart Failure Traffic Lights

## Ivabradine (NICE 2012)

NICE TA 267: Ivabradine is recommended as an option for treating chronic heart failure for people:

- with NYHA class II to IV stable chronic heart failure with systolic dysfunction **and**
- who are in sinus rhythm with a heart rate of 75 bpm or more **and**
- who are given ivabradine in combination with standard therapy including beta-blocker therapy, ACE inhibitors and aldosterone antagonists, or when beta-blocker therapy is contraindicated or not tolerated **and**
- with a left ventricular ejection fraction of 35% or less.

Ivabradine should only be initiated after a stabilisation period of 4 weeks optimised standard therapy with ACE inhibitors, beta-blockers and aldosterone antagonists.

**Initiation:**

In line with NICE recommendations, Ivabradine for heart failure should be initiated by a heart failure specialist with access to a multidisciplinary heart failure team. Dose titration and monitoring should be carried out by a heart failure specialist, or in primary care by a heart failure specialist nurse.

Do not initiate in acute heart failure or if heart rate < 75 beats per minute.

Ventricular rate at rest should not be allowed to fall below 50 beats per minute

| Medicine | Dosage Increments | Target Dose |
|---|---|---|
| Ivabradine | 2.5mg bd*, 5mg bd, 7.5mg bd | Dose that maintains resting HR between 50 and 60 beats per minute without intolerable side-effects |

**Titration:**

Usual starting dose is 5mg bd (2.5mg bd* in patients >75yrs old). After two weeks of treatment, the dose can be increased to 7.5mg bd (5mg bd in patients >75yrs old) if resting heart rate is persistently above 60 beats per minute., or decreased to 2.5mg bd* if resting heart rate is persistently below 50 beats per minute or if patient is experiencing side-effects related to bradycardia (e.g. dizziness, fatigue or hypotension). If heart rate is between 50 and 60 bpm, the dose of 5 mg twice daily should be maintained. Discontinue use if heart rate remains below 50 beats per minute **or** symptoms of bradycardia persist despite dose reduction.

**2.5mg doses should be administered using half a 5mg tablet. Avoid 2.5mg tablets due to considerable cost.*

## Sacubitril/Valsartan (Entresto®) (NICE 2016)

Recommended for patients in NYHA II-IV with LVEF<35% who remain symptomatic despite treatment with a stable dose of ACE inhibitors or ARBs.

**Initiation:**

In line with NICE recommendations, Entresto® should be initiated by a heart failure specialist with access to a multidisciplinary heart failure team. Dose titration and monitoring should be carried out by a heart failure specialist, or in primary care by a heart failure specialist nurse. Do not initiate in patients with a history of angioedema or concomitant use with ACE inhibitors or ARBs. **DO NOT INITIATE THERAPY UNTIL AT LEAST 36 HOURS AFTER STOPPING ACE INHIBITOR THERAPY .** Avoid if systolic BP<100mmHg. Stop nitrate if Entresto® started due to risk of profound hypotension. Entresto® has diuretic effects so a reduction in loop diuretic dose may be required. **Monitor U&Es, creatinine and BP prior to each dose increase.**

**Titration:**

Initially 49/51 mg twice daily for 2–4 weeks, increased if tolerated to 97/103 mg twice daily. A lower started dose of 24mg/26mg twice daily is recommended in patients currently not taking ACE inhibiors or ARBs or in renal impairment. Consider this lower starting dose in patients with SBP<110mmHg.

## Dapagliflozin (NICE 2021)

Recommended for patients with symptomatic chronic heart failure with reduced ejection fraction when used as an add-on to optimised standard care.

**Initiation:**

In line with NICE recommendations, dapagliflozin should be initiated on the advice of a heart failure specialist. It should be used in addition to ACE inhibitors or ARBs, beta blockers, and aldosterone antagonists or sacubitril valsartan, with beta blockers and aldosterone antagonists. Avoid in patients with Type 1 diabetes.

The recommended dose is 10 mg dapagliflozin once daily. There is limited experience with dapagliflozin for the treatment of heart failure in patients with severe renal impairment (GFR < 30 mL/min). When dapagliflozin is used in patients with type 2 diabetes using insulin or taking an insulin secretagogue, such as a sulphonylurea, a lower dose of insulin or insulin secretagogue may be considered to reduce the risk of hypoglycaemia. Dapagliflozin has diuretic effects so a reduction in loop diuretic dose may be required.

# Heart Failure Medication Summary - for use with Nottinghamshire Heart Failure Traffic Lights

## Hydralazine / Nitrate combination

NICE (2018) recommend that Hydralazine / Nitrate combination may be prescribed in patients who are intolerant of ACE inhibitors and ARBs or in addition to these agents in patients who remain symptomatic. Avoid in combination with Entresto® due to risk of profound hypotension.

| Medicine | Start Dose | Maintenance Dose |
|---|---|---|
| Hydralazine Hydrochloride | 25mg TDS – QDS | 50-75mg QDS |
| Isosorbide Mononitrate | 20mg BD or 30mg MR OD | 120mg per day (divided doses) |

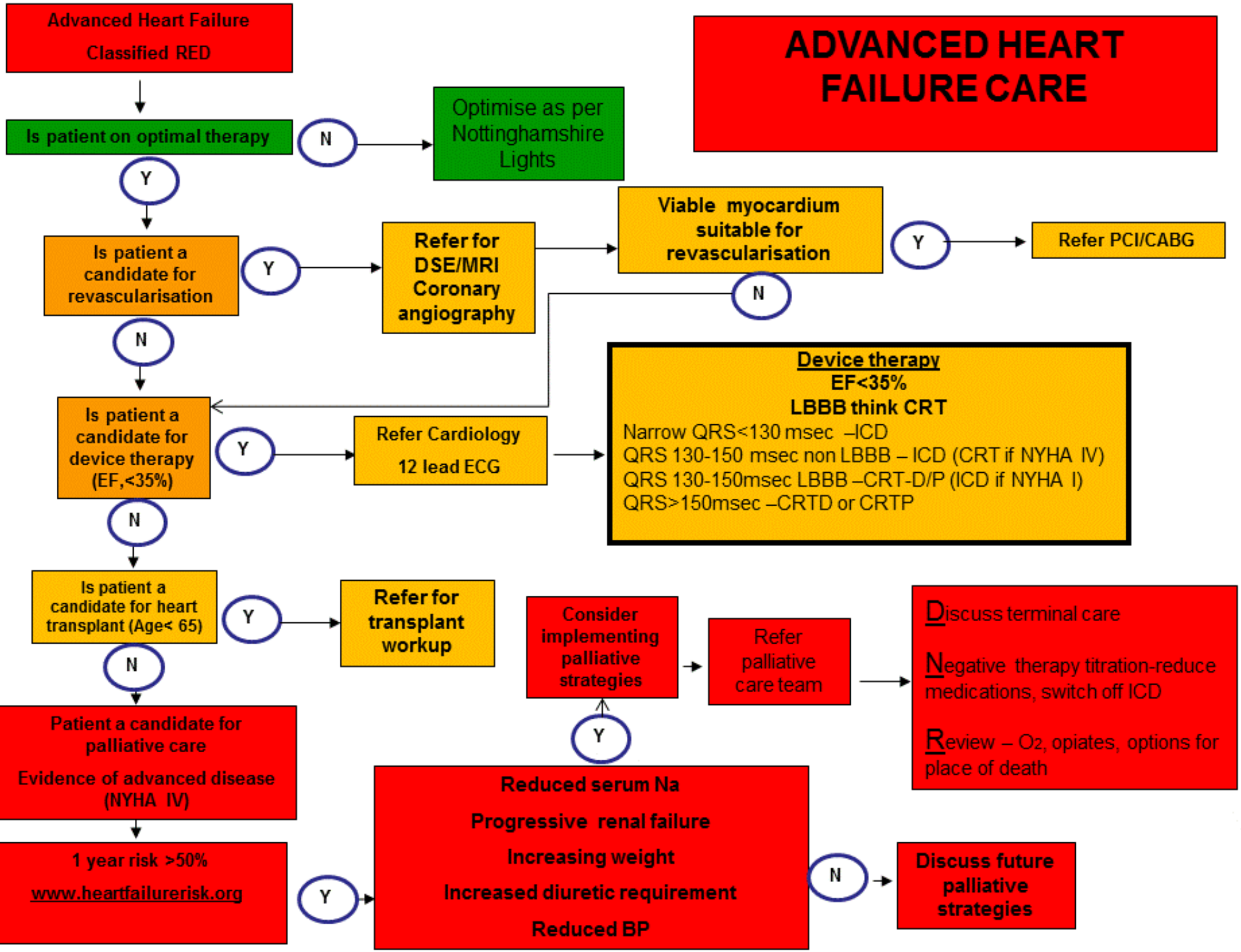
## Thiazide Diuretics-Metolazone and Bendroflumethiazide

Bendroflumethiazide or Metolazone (2.5mg-5mg given once, twice or three times a week depending on patients condition) may be useful in patients with resistance to large doses of loop diuretic. This should be undertaken in liaison with a Cardiologist. Close supervision and monitoring of symptoms, fluid balance and electrolytes will be required for these patients. Patients newly initiated on thiazides with loop diuretics should have their renal function checked as follows:

**Once weekly thiazide - U+E every two weeks Twice weekly thiazide - U+E once a week Three times a week thiazide - U+E should be checked twice a week**
NB. If patient on Metolazone for longer than three months & renal function stable, use clinical judgement in relation to frequency of monitoring as agreed with cardiologists

Metolazone is no longer manufactured in the UK — it can be imported into the UK, but some importable brands contain dyes not approved for use in the EU.
Bendroflumethiazide will be considered the first line thiazide in patients requiring sequential nephron blockade, but where metolazone is considered to be required, this can be accessed and supplied by secondary care
Patients in whom metolazone is no longer appropriate or available should be switched to the equivalent dose of bendroflumethiazide under careful medical supervision as equivalent efficacy can not be assumed.

# ADVANCED HEART FAILURE CARE



# End of Life Care Guide – Details of care provision

## Prognosis < 1 year/months

- GSF initiated
- Carer needs assessment fast-tracked
- Holistic needs assessed
- Understanding and information needs assessed
- Consider NHS Continuing Health Care
- Appoint lead GP / nurse
- DS1500 completed (if < 6 months)

- EPaCCS consent, complete, Special Patient Note (SPN) where required
- Advance care planning (ACP) inc. ADRT, PPC initiated
- DNACPR status reviewed and communicated
- Respite care arranged if appropriate
- Blue Badge application fast-tracked if applicable
- Medication reviewed

## Prognosis - weeks

- ACP inc. ADRT, PPC reviewed
- DNACPR status reviewed and communicated
- Continuing Care fast track completed if additional service funding required
- Anticipatory medications supplied
- Carer needs reviewed
- Support arranged for provision of terminal care in setting of patient's choice e.g. Hospice at Home
- EPaCCS/Special Patient Note updated

## Prognosis - days

- Priorities of Care of the Dying Person – Create an individual plan of care
- Bereavement support needs assessed
- EPaCCS / Special Patient Note updated

## After death

- Verification of death
- Care after death
- Bereavement support needs assessed and agreed. Referral made for further support if appropriate.
- Review case in MDT
- Consider after death audit
- EPaCCs/Special Patient Note updated

The following will be provided at the appropriate time according to individual patient and carer needs:

Specialist care (condition-specific and/or palliative)
Specialist psychological support
Respite care
Spiritual support
Self-help and support services
Equipment

24 hour access to advice and co-ordination of care underpin the guide

# Acute Heart Failure Assessment and Management

**Suspicion of acute heart failure**

**History and Physical Examination**

**Consider Cause and Contributory Factors**

**Rapidly assess clinical haemodynamic profile**

**- Congestion: Yes or No (Wet or Dry)**

**- Perfusion decreased : Yes or No (Warm or Cold)**

**Investigations**

**BNP > 300 pg/ml**

**Bloods - FBC, Electrolytes, LFT, Glucose, TFT, Troponin**

**ECG – look for ischaemia and assess rhythm**

**CXR – Congestion and/or Cardiomegaly**

**Echocardiogram – urgent if cardiogenic shock or within 48 hours IF heart structure/function unknown and/or may have changed**

**CHAMPS**

- **C**oronary Syndrome
- **H**ypertension
- **A**rrhythmmia (AF)
- **M**echanical
- **P**ulmonary Embolism
- **S**econdary factors

- Infection
- CVA
- Anaemia
- Thyroid disease, DKA
- AKI
- COPD

**ADMIT TO CCU/ACU/ITU**

**VENTILATION**

- O2 sats <90% and/or using accessory muscle of respiration (Resp rate >25/min) - consider CPAP/BIPAP initially. Assess for intubation if failure to improve

**HYPOPERFUSION**

- Cold/clammy, oliguria, dizziness, confusion, narrow pulse pressure

**HEART RATE**

- <40/min or >140/min

**SYSTOLIC BP**

- <90mmHg

**Dry-Warm profile**

Continue oral heart failure medications

Consider PE, ACS, Arryhthmmia (AF)

ADMIT TO WARD

**Wet-Warm profile**

- Give loop diuretics
- Start iv nitrates
- Oxygen if hypoxia

ADMIT WARD or CCU/ACU

**Wet-Cold profile**

- Give iv loop diuretics
- Consider Right heart catheter
- Start iv nitrates if high SVR and SBP>90mmHg
- Give inotropes/pressor if low SVR and/or SBP<90mmHg

ADMIT CCU/ACU

Consider mechanical support

**Dry-Cold profile**

Consider Right heart catheter and fluid challenge

Inotropes/pressor if low SVR

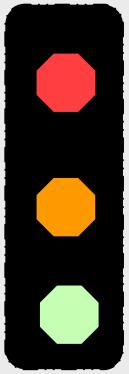
ADMIT CCU/ACU

**When stable discharge to ward and optimise medications as per the Nottinghamshire lights**

**Ensure stable symptoms, weight and heart rate for minimum of 48 hours pre-discharge**

**PRE-DISCHARGE REFER ALL PATIENTS WITH CONFIRMED HEART FAILURE TO HEART FAILURE SERVICE**

**KEY: Traffic Lights**



CCU/ACU/ ICU based therapy

CCU/ACU based therapy

Ward based therapy

# Acute Heart Failure Medication Summary Lights

## Loop Diuretics

Indicated in patients with signs and symptoms of decompensating heart failure, such as evidence of oedema, worsening breathlessness, orthopnoea or paroxysmal nocturnal dyspnoea.

Target doses for loop diuretics in acute heart failure

In patients with new onset acute failure starting does of furosemide is 40mg IV
In patients already taking diuretics the initial IV dose should be at least equal to or one stage higher than maintenance dose.
Patients' signs and symptoms should be reviewed three days after the dose is increased or decreased and if the dose is sustained U+Es checked thereafter.

**An increase in diuretic should be considered when:**

- Increase in daily weights of ≥2kg (approximately 4lbs) over 2-3 days
- Increased dyspnoea.
- Increased oedema.

**A decrease in diuretic should be considered when:**

- Decrease in daily weight to 1kg less than dry weight sustained over 2/3 days.
- No symptoms of dyspnoea
- No oedema
- Symptoms of dehydration (eg thirst, dizziness, hypotension).

| Increasing Furosemide | |
|---|---|
| Admission dose: | Increase to: |
| 40mg OD | 80mg IV |
| 80mg OD | 120mg IV |
| 120-160mg DAILY | 160 –240mg usually as 24 hour infusion or divided boluses |

| Increasing Bumetanide | |
|---|---|
| Admission dose: | Increase to: |
| 1mg OD | Furosemide 80mg IV |
| 2mg OD | Furosemide 120mg IV |
| 3 –4mg OD | 160 –240mg furosemide usually as 24 hour infusion or divided boluses |

## Vasodilators

**- Indicated in patients with moderate to severe symptom when systolic BP>90mmHg**
**- Decrease venous tone (preload) and arterial tone (afterload).**
**- Use with caution to avoid excessive drops in BP**
**- Use with caution in patients with significant aortic and mitral stenosis**

Side effects of vasodilators

Hypotension, headache, tolerance with continuous use

| | Dose | Dosage Increments |
|---|---|---|
| Glyceryl trinitrate (GTN) | 10-20 micrograms/ min | Can increase to 200 micrograms/ min |
| Isosorbide dinitrate | Start at 1mg/ hr | Can increase to 10mg/hr |

## Inotropes

**Reserve for patients with severe HF and associated haemodynamic compromise**
**Main use is in HYPOTENSIVE heart failure**
**May exacerbate cardiac ischaemia and provoke arrhythmias especially in patients with ischaemic heart failure - CONSIDER need of urgent PCI and /or balloon pump in these cases.**
**ECG monitoring and admission to high dependency area is MANDATORY**

**DISCUSS PATIENTS WITH CARDIOGENIC SHOCK AND A NEED FOR INOTROPES EARLY WITH CADIOLOGY AND/OR ICU**

| | Dose | Notes |
|---|---|---|
| **Dobutamine** | 2-20micrograms/ kg/min | Increase by 2.5 micrograms/kg/ min every 15 mins until SBP>100mmHg |
| **Dopamine** | 3-5 micrograms/kg/ min<br>>5g/kg/min | Inotropic dose<br>Vasopressor dose |
| **Noradrenaline** | 0.2-1.0 micrograms/kg/ min | |
| **Enoximone** | 0.5-1.0 mg/kg bolus over 10 mins | 5-20 micrograms/kg/min infusion |

| Version Control– Nottinghamshire Heart Failure Traffic Light Guidelines | | | |
|---|---|---|---|
| Version | Author(s) | Date | Changes |
| 1.2 | Lynne Kennell | May 2021 | Dapagliflozin added as per NICE TA.<br>Advice regarding loop diuretic dose reduction when initiating Entresto added.<br>Advice to avoid nitrate/ Entresto combination added. |
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