Nottingham University Hospitals NHS
NHS Trust

Nottinghamshire Heart Failure Traffic Light Guidelines

Red – Cardiology Care

Amber – Care shared

Green – Primary Care/Non specialist

Author - Dr John Walsh (john.walsh@nuh.nhs.uk)
Consultant Cardiologist Nottingham University Hospitals

The Heart Failure Nottinghamshire Lights

NHS
Nottinghamshire Area Prescribing Committee

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 2010). 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. The Heart Failure traffic light classification differs from the APC classification but is to be used in conjunction with NICE (2010) guidelines.

PATIENTS MAY BE REFERRED DIRECTLY TO HEART FAILURE CLINICS AT NUH or KMH

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. Combination therapy with hydralazine and nitrates should be considered as an alternative baseline therapy in Afro-Caribbean patients.**

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).**

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 IMPLANTATION.

Approved by Nottinghamshire APC March 2017 Review Date March 2020 Authors : Dr John Walsh (johh.walsh@nuh.nhs.uk) and Notts Heart Failure Group

CLINICAL / THERAPEUTIC CLASSIFICATION

SERVICE CLASSIFICATION

Green

CLINICAL
Stable with diagnosis confirmed by Echo, and/or no unplanned HF admissions in the previous 6 months

THERAPY
Baseline therapy:
- ACE or ARB if ACE intolerant or Hydralazine with nitrate if ACE and ARB intolerance or Afro-Caribbean
- Beta-blocker
- Diuretic (if fluid retention)

Amber

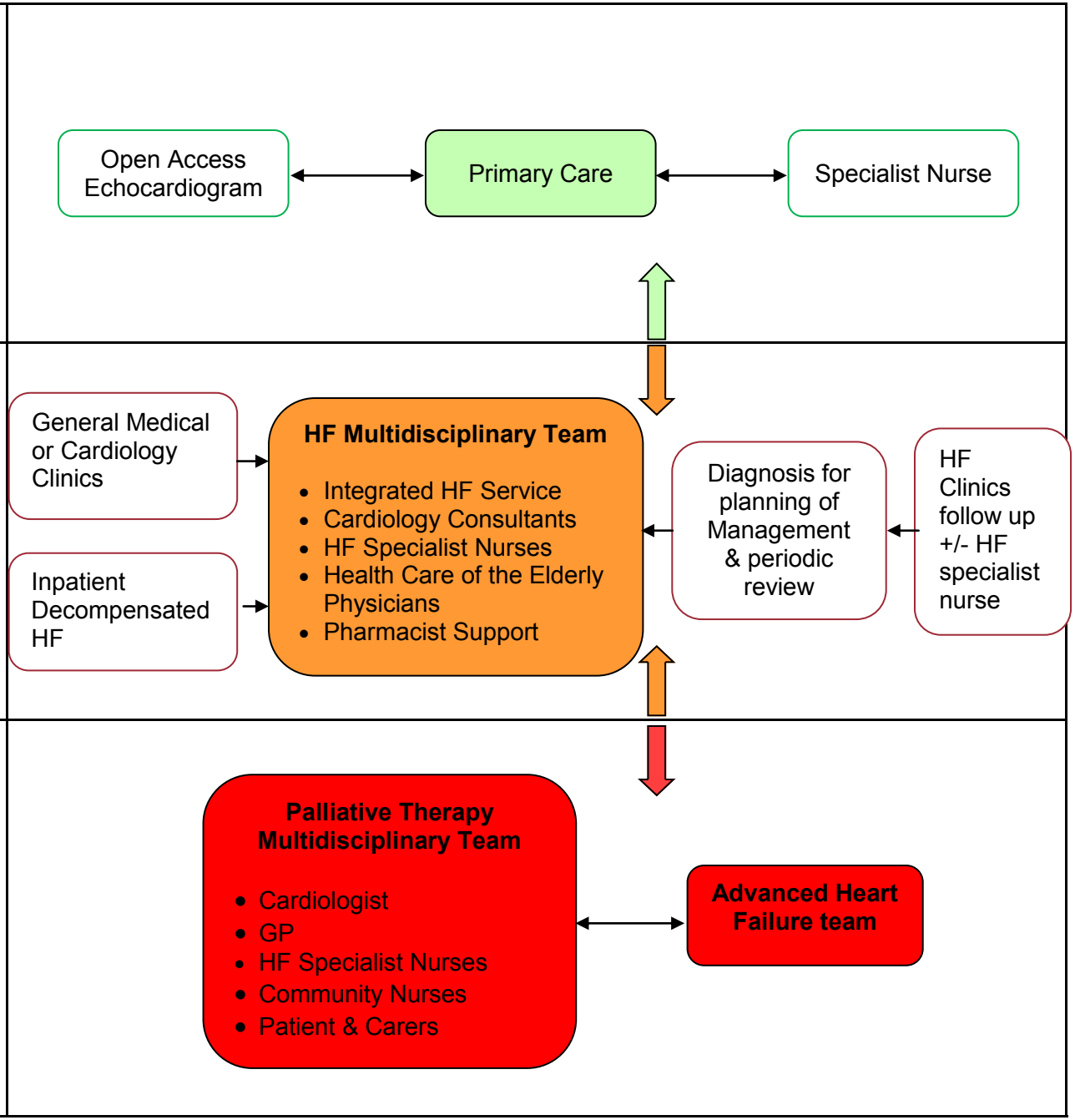
CLINICAL
Unstable and/or 1-2 unplanned HF admissions in the previous 6 months

THERAPY
Intermediate therapy:
- Failed baseline therapy or
- On-going baseline therapy AND Spironolactone or Eplerenone added
- Consider addition of Ivabradine if HR >75 beats per minute and ejection fraction <35%
- Consider sacubitril/valsartan (Entresto®)

Red

CLINICAL
Unstable and/or 2 unplanned HF admissions in the previous 6 months, advanced care or palliation to be considered

THERAPY
Advanced therapy:
- Addition of Digoxin if AF or on-going symptoms despite intermediate therapy
- Addition of ARB to intermediate therapy
- Thiazide therapy required in addition to loop diuretics



Diagnosing heart failure (1)

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

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

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)

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

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

Heart Failure unlikely, consider other diagnosis

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

Valve disease or other structural abnormality

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

Cardiology referral

Diagnosing heart failure (2) — Diastolic dysfunction

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

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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 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

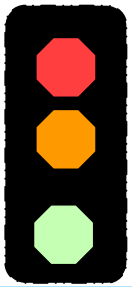
Heart failure due to left ventricular systolic dysfunction **(HFrEF) - EF<40%**

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, **C**onsider **LOOP DIURETICS** for symptomatic relief of congestion/fluid retention (aim for minimum maintenance dose)

KEY: Traffic Lights



Advanced/Palliative

Intermediate Therapy

Baseline Therapy

Drug Therapy Titration steps

Month1- ACE, Beta blocker ± Diuretic
Month 2- Add Spironolactone or Eplerenone
Month 3- Add Ivabradine

Month 4- Consider 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 if 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 cessation of ACE inhibitors or ARB and switch to **ARNI. SACUBITRIL-VALSARTAN (ENTRESTO®)** in patients with LVEF<35% who remain symptomatic (NYHA II-IV) despite taking a stable dose of ACE inhibitor or ARB.
- An **ARB** licensed for heart failure in addition to ACE inhibitor
- Add **HYDRALAZINE WITH A NITRATE** (especially in people of African or Caribbean origin with moderate to severe heart failure)

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**

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

Nottinghamshire Area Prescribing Committee

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

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

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

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.

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).

Hydralazine / Nitrate combination

Evidence suggests that the AfroCarribean population tend to have a less active renin-angiotensin system and less bioavailable nitric oxide than Caucasians. NICE (2003) 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 AfroCarribean patients who remain symptomatic (Scottish Intercollegiate Guidelines Network (SIGN), 2007).

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)

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

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
- 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*	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: maximum dose 25 mg twice daily if **severe** heart failure. For patients with mild to moderate heart failure maximum dose 50 mg twice daily if weight more than 85 kg – otherwise maximum dose 25 mg BD.

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.

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

Titration:

Usual starting dose is one tablet of 49/51mg as single tablet complex doubles at 2-4 weeks to target dose of one tablet 97mg/103mg twice daily. Consider lower starting dose of 24mg/26mg twice daily in pts not currently taking ACE inhibitors or ARBs, patients with SBP<120mmHg or renal impairment .

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

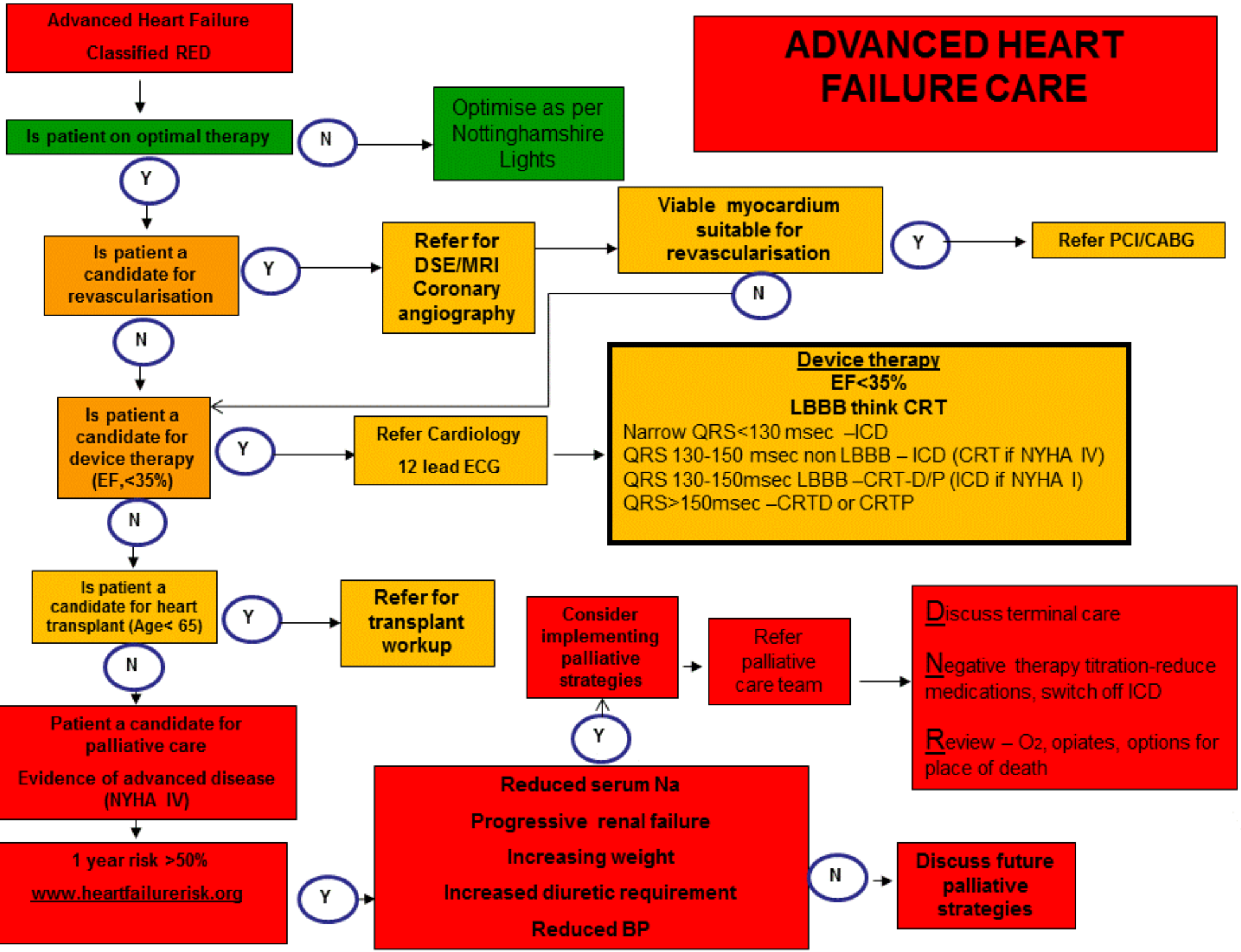
NB. If patient on Metolazone for longer than three months & renal function stable, use clinical judgement in relation to frequency of monitoring as agreed with cardiologists

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

DEFIBRILLATOR DEACTIVATION

NUH ICD Deactivation algorithm

Patient with ICD approaches end of life
Decision to institute End of Life Care

↓

Discuss ICD deactivation as early as possible with patient

Discussion can be led by any health professional with main responsibility for care at point of instituting End of Life care, including the multi-disciplinary team

↓

Agree decision to deactivate ICD and logistics of ICD deactivation with, in order of preference:

1. Patient's Cardiologist, *OR*
2. Device consultant (Drs Ahsan, Walsh, Staniforth, Robinson, Chuen, Jamil-Copley), *OR*
3. On call Consultant Cardiologist

↓

Planned deactivation
(09:00-17:00 hrs only)

↓

Complete 'Request for Deactivation of ICD' form

↓

Contact Pacing clinic to:

1. Arrange ICD deactivation
2. Send and ensure receipt of 'Request for Deactivation of ICD' form

Telephone number: 01159691169 Ext 56177
Fax number: 0115 9628097

↓

ICD deactivation

1. Patient attends Pacing Clinic, *OR*
2. Cardiac Physiologist attends current patient location

↓

Pacing Clinic to send copy of 'Request for Deactivation of ICD' form to:

1. GP
2. Multi-disciplinary team
3. Scan onto NOTIS as 'ICD Deactivation Document'

Emergency temporary deactivation
(Anytime)

↓

17:00-09:00 hrs while awaiting planned deactivation, *OR*

Cardiac Physiologist is unable to get to the patient immediately, *OR*

Patient is imminently dying

↓

Place a magnet over the ICD site on the patient's skin, and ensure it is taped down

Magnet will deactivate shock function but not bradycardia pacing

Magnet needs to be kept in position to deactivate the ICD, including after death

Magnets can be found on
1. Acute Cardiac Care unit (NCH Ext 56613)
2. D55 (QMC Ext 69055)