Heart Failure Diagnosis, Treatment & Services

NHS South Yorkshire Integrated Care Board

History / Clinical examination
Measure Serum N-terminal Pro-Brain Natriuretic peptide **(NT-proBNP)**

(NT-proBNP) sample
Gold top SST tube
separate tube for other samples

In people presenting with newly suspected acute heart failure, a single **NT-proBNP < 300ng/L** is used to rule out diagnosis of heart failure

NT-proBNP <400ng/L
Heart failure unlikely
(Not for diagnostic heart failure clinic)

NT-proBNP 400-2000ng/L

NT-proBNP > 2000ng/L

No previous MI

Previous MI

Referral
Diagnostic Heart Failure Clinic
within **6 weeks**

Referral
Diagnostic Heart Failure Clinic
within **2 weeks**

Heart failure symptoms

- Breathlessness (NYHA II-III)
  class I no limitation of physical activity
  class II slight limitation of physical activity
  class III marked limitation of physical activity
  class IV inability to do any physical activity
- Orthopnoea/
- Paroxysmal Nocturnal Dyspnoea
- Peripheral oedema
- Bi-basal inspiratory crackles

GP Referral requirements for Diagnostic Heart Failure Clinic (in addition to BNP)

- Symptoms
- UE, FBC, TFT, LFT, BNP, lipids, HbA1c
- BP, pulse, weight
- Medication list allergies
- Urine analysis

Diagnostic Heart Failure clinic

Echo, ECG, assess severity, aetiology, precipitating factors, type of cardiac dysfunction, correctable causes, patient plan

Heart Failure Diagnosis

Discharged back to GP care:

+/- Medical management
+/- Cardiac rehab referral
+/- Patient education
- Patient Information leaflets
https://pumpingmarvellous.org/heart-failure-guide/

Heart failure with
Preserved / mildly reduced Ejection Fraction (EF)

Also known as:
HFpEF (EF > 50%)
HFmrEF (EF > 40%)

Heart failure with
Moderate to severe Left Ventricular systolic Dysfunction (LVSD)

Also known as:
HFrEF (EF < 40 %)

Cardiology Nurse Specialist follow up
+/- referral for further investigation / procedure
+/- Comm. Heart Failure Nurse
+/- Palliative Care

Symptomatic treatment of fluid retention/congestion with DIURETICS

(also suitable for management in preserved/mildly reduced EF)

Diuretic treatment is the first line treatment for ALL patients with heart failure irrespective of the underlying left ventricular ejection fraction.
Traditionally diuretic Tx has been cautiously used but remains the most effective Tx for **symptom relief**
LOOP Diuretics Titrate dose (up or down) depending on degree of oedema and patient response.
Combine with advice on **Fluid management** and **daily weights**
Monitor renal function + BP (lying and standing)
Poor renal function is not an absolute contraindication. Indeed, the worse the eGFR, the higher the dose of diuretic needed to be effective.
Hyponatraemia, especially with fluid overload, is often dilutional, and will improve with diuretics.

Consider alternative causes:

- Medication
- Nephrotic syndrome
- Gravitational oedema
- Lymphoedema
- Deep vein thrombosis
- Other causes of SOB

Evidence of Fluid Overload
SOB, Orthopnoea, PND, Peripheral oedema, raised JVP

Initiate **LOOP DIURETIC** therapy
FUROSEMIDE 40mg OD or BUMETANIDE 1mg OD

*Patients with reduced eGFR may need higher initial does

Increased urine output at 4-6 hours post dose?

No

Increase dose of diuretic
e.g. **Furosemide**
40mg to 80mg

Yes

Symptoms resolved

Continue current dose of diuretic
Review 2-4 weeks

Symptoms persist

Increase frequency
of current dose (e.g. BD)

Symptoms persist

Options:

- Switch Furosemide to Bumetanide
- Check fluid & Salt intake compliance
- Add Thiazide and/or MRA (referral heart failure nurses)

Symptoms/Oedema persist

Seek Specialist Advice

Patient education-fluids/ self-weighing

- Daily weights (1kg=1L, rapid gain/loss likely fluid related) Weigh daily morning after voiding, before dressing, before eating
- if more than 1.5 to 2kg / 3 /4 lb increase in 2 days contact nurse
- Salt restriction
- Ensure passing urine.
- Sick day information
- Do not fluid restrict patients.

Troubleshooting diuretics:

- If hypokalaemia add MRA) if eGFR >30)
- Allow ~20% change in baseline creatinine
- Persist with diuretics if giving symptom relief.
- Hyponatraemia in presence fluid overload often dilutional (continue diuretics)
- Switching furosemide to bumetanide (better bioavailability) can improve response.
- If marked fluid overload, add STAT dose thiazide diuretic (heart failure nurses)

Key
SOB- shortness of breath
PND- paroxysmal nocturnal dyspnoea
OD- once daily
BD- twice daily
JVP- jugular venous pressure

Acknowledgement: Permission has been kindly granted by the Leeds Heart Failure Services. This page of the pathway has been amended from the Leeds Integrated Heart failure Pathway

Heart Failure Treatment Guidelines

Primary Care management for Preserved / mildly reduced Ejection Fraction

Example titrations of the various drugs to improve prognosis in confirmed Heart Failure diagnosis.
Aim to titrate ACE /ARBs +/- B-blockers to maximum dose (or maximum tolerated) even if patient asymptomatic/ old diagnosis of Heart failure.
Always consider individual patient factors to determin speed of titration (renal function and frailty ect.)

ACE Inhibitor (ACEI)						
	Week 1	Week 3	Week 5	Week 7	Week 9	Week 12
Ramipril	1.25mg	2.5mg	5mg	7.5mg	10mg	
lisinopril	2.5mg	5mg	10mg	20mg	30mg	35mg max dose
Enalapril	2.5mg	5mg	10mg	20mg	20mg bd max dose	
Angiotensin Receptor Blocker (ARB) If intolerant of ACEI (dry cough, headache)						
	Week1	Week 3	Week 5	Week 7	Week 9	Week12
Candesartan (OD dosing)	4 mg	8mg	16mg	24mg	32mg	
Valsartan (BD dosing)	40 mg	80mg	120mg	160mg		
Losartan (OD dosing)	12.5mg	25mg	50mg	100mg	150mg	
If EF < 50% **ADD Beta Blockers** (even if PVD, ED/COPD) In Sinus rhythm, target heart rate 60-70/min, In Atrial Fibrillation aim for mean heart rate 60-80/min, MI 50-60/min If patient has COPD and develops respiratory symptoms, switch to Metoprolol						
	Week1	Week 3	Week 5	Week 7	Week 9	Week 12
Bisoprolol (OD dosing)	1.25mg	2.5mg	3.75mg	5mg	7.5mg	10mg
Carvedilol (BD dosing)	3.125mg BD	6.25mg BD	12.5mg BD	25mg BD	50mg BD if >85kg	
Metoprolol (BD dosing)	25mg BD (or 12.5mg If elderly or frail)	50mg BD	75mg BD	100mg BD		
Nebivolol OD	1.25mg	2.5mg	5mg	10mg		

General principles of management in primary care

Monitor Baseline & During Titration functional capacity / fluid status / cardiac rhythm:

- B-blockers and ACE1/ARB should be titrated to maximum dose or maximum tolerated doses
- Pulse and BP should be done each dose titration.
- Renal function & U+E should be done at baseline and then with each dose change (ACE1/ARB/Diuretic/MRA)
  - eGFR < 45 start low and titrate to response.
  - eGFR < 30 (advice and guidance from heart failure nurses or consider renal referral)
  - Higher doses of diuretics maybe needed for effective diuresis in poor renal function
- Heart rate - if heart rate is <50bpm, consider dose reduction/stopping b-blockers
- Continue to titrate blood pressure medications unless hypotensive symptoms following dose change
- If evidence of hypotension
  - consider lying/standing BP
  - code maximum tolerated dose when you have achieved optimal dosing for the patient.
- Monitor response and need for diuretic every 2-3 weeks while on acute course of Loop diuretics for oedema.
  - Breathlessness should be assessed using the NYHA classification and recorded in the notes to assess symptom improvement / progression.
  - Chest Auscultation if indicated.
- BNP - Consider retesting if patient still symptomatic.
  - not for prognostic value – only of benefit if assessing for differential diagnosis

6 monthly / Annual Review in Primary Care (NICE recommends 6 months)

- Diagnosis confirmed/ Current symptoms
- First line therapy doses optimised
- Cardiac Rehabilitation referral consideration (16 exercise & education sessions delivered over 8 weeks from four venues across Barnsley)
- Self-management
- Need for review/referral into cardiology clinic if
  - Candidate for device therapy (broad QRS > 120msec, LVEF <35%
  - Approaching end of life/need for palliative Care
- If on max tolerated b-blocker and ACE and still symptomatic, refer to Heart Failure nurses – see page 6

Heart failure nurses/secondary care management for moderate to severely reduced Ejection Fraction

Or if still symptomatic on max primary care treatment.

MRA – Mineralocorticoid Receptor Antagonist				
Spironolactone	Heart failure	if Cr <200 & K+ <5.0mmol Initially 12.5mg-25mg OD (depending on frailty)	After 2 weeks if Cr <200umol and K+< 5mmol then increase to 25-50mg (depending on frailty)	After a further two week, <50% increase in K+ and less than 5.5mmol and nil s/e, continue Monitor U+Es at: 2w..4w..8w..12w..6mthly
	Oedema, congestive heart failure	25-50mg in single or divided dosed according to response		
Eplerenone	Post MI or side effects with spironolactone	Initially 25mg OD	Increased up to 50mg OD	Monitor K+ and Cr during treatment
SGLT2i – Sodium glucose co-transporter 2 Amber 1 – no formal shared care needed - on advice of specialist for heart failure Allow for 4 weeks before checking U&Es, transient reduction in eGFR expected				
Dapagliflozin	10mg OD. No dose titration required. Only initiate if eGFR >30ml/min Ensure no previous evidence of DKA			If eGFR falls <30ml/min on two consecutive readings, then discontinue. In Type 2DM if the eGFR falls below 45ml/min then discuss with diabetic team about possible reduction in other hyperglycaemic drugs.
Empagliflozin	10mg OD. No dose titration required. In patients with or without T2DM, avoid if eGFR is <20ml/min			If eGFR falls <20ml/min on two consecutive readings, then discontinue. Note not to test for at least 4 weeks after initiation
Entresto - Sacubitril with valsartan Specialist advice only: full shared care request needed				
Entresto	HF nurses/cardiology to titrate to response before requesting shared care prescribing in primary care			Entresto will replace ACE, this is not an add on therapy Comes in 3 strengths: 24/26mg, 49/51mg and 97/103mg
Ivabradine Amber 1 – no formal shared care needed				
Ivabradine	To be considered if max tolerated dose or on 10mg of bisoprolol and HR>75 OR symptoms of hypotension, fatigue, sensitivity to bisoprolol			

Community Heart Failure Specialist Nursing Service

If patient still symptomatic on maximum tolerated therapy in primary care, consider referral to the Heart Failure Specialist Nurse Service.

• A **referral form** and **copy of echocardiogram** result should be send to: **rightcarebarnsleyintegratedspa@swyt.nhs.uk**

The rerral form can be found on the clinical systems

Referral Criteria / Requirements	Exclusion Criteria
Need to have already been seen in HF diagnosis clinic	If still undergoing Heart failure Diagnosis
Echo- Up to date echo within last year Post MI- require a repeat echo 3 months post MI	**Echo**- not done – or last echo over a year ago
Ejection fraction < 40%	**Ejection Fraction > 40%** – GP management expected Right ventricular systolic dysfunction Preserved ejection Fraction (HFpEF) Diastolic Heart Failure
Unstable patients decompensated/ exacerbated/advanced heart failure oedematous/ breathless/worsening NYHA	**Stable** patients on optimal treatment Patient discharged from the Heart Failure Service - within last 12 months - with no symptom / medication changes within this time.
End of Life	Renal Dialysis Patients - refer to Renal Team
Anaemia with Heart Failure	

Heart Failure – Advanced Care Planning / EOL

CONSIDER FOR PALLIATION/EOL/ CANDIDATES FOR DEVICE THERAPY/ TRANSPLANT

Multiple admissions with decompensated HF

Increasing diuretic resistance

Worsening renal function

NYHA class IV

Hypotensive

Having to cut back/stop medications.

Further consideration in providing holistic care	
Sharing Info & Conversations	Via EPaCCs
Holistic Planning for decline	With patient and family as appropriate
Risk Stratification	via SPICT tool
Palliative Care:	MDT role- drug doses/ therapy continuation etc. MDT membership: Cardiologist, Palliative Care, HF Nurses