

# Heart Failure Diagnostic Pathway

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# New Diagnostic Pathway for Heart Failure

- Why do we need a new diagnostic pathway for HF?
- What are the benefits of the pathway?
- What is the new diagnostic pathway?
- How did it perform?
- How was the service designed and the costs met?

# New Diagnostic Pathway for Heart Failure

- *Why do we need a new diagnostic pathway for HF?*
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# Why do we need a new diagnostic pathway for HF?

- HF can be difficult to diagnose
  - Relies on identification of signs and symptoms
  - Echocardiography is the cornerstone of diagnosis
  - New blood tests are helping to refine the diagnosis
    - BNP and NT-proBNP
- HF costs the NHS a lot of money
  - 2% of annual expenditure
- Effective therapies are available
  - Medication (ACE inhibitors, beta blockers) through to cardiac resynchronisation and transplantation

# Benefits to the patient

- Find the cause of HF
  - valve disease, HOCM, and many others
- Access to life saving therapy
  - ACE inhibitors, beta-blockers, mineralocorticoid receptor blockers, cardiac resynchronisation therapy
- Contact with services
  - HF specialists, HF Nurse Liaison Service, Transplant services, Palliative care

# The Old Model

Direct/ Open access echo

Suspected heart failure in primary care



Direct access echocardiography



LVSD



Result to GP



No  
LVSD



ACE inhibitor

No ACE inhibitor

# The Old Model

Direct/ Open access echo

**NO HF SPECIALIST  
DIRECTLY INVOLVED**



**No diagnosis, limited therapy**

# Benefits for primary care

## Pros

- Allows those without HF to have HF excluded without waiting to see cardiologist
- Allows those with symptoms and evidence of cardiac disease to see cardiologist for diagnosis and management plan (including treatment)

## Cons ?

- Only valuable if applied to the correct patients

# Benefits for secondary care

## Pros

- Allows those without HF to have HF excluded without waiting to see cardiologist
- Allows those with symptoms and evidence of cardiac disease to see cardiologist for diagnosis and management plan (including treatment)
- Frees up resources for other patients and services

## Cons ?

- Only valuable if applied to the correct patients

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# How should heart failure be investigated?

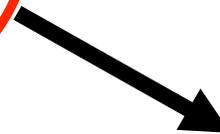
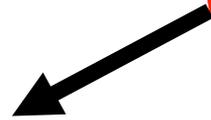
Suspected HF in primary care



Refer to HF diagnostic service

**ECG / BNP**

Recommended  
by  
SIGN/ ESC



If normal HF unlikely  
Return to GP  
without cardiological  
review

If abnormal, echo and cardiology  
review (aetiology, investigation  
and management plan)

# What is BNP?

- Peptide produced in LV wall
- Plasma levels high in HF
- Very high negative predictive value
- Caution
  - raised in renal dysfunction, pulmonary embolism, acute ischaemia, hypertension/ LVH
  - plasma levels can be normal if treated HF
- recommended by SIGN

**Appendix 1:**

**West of Scotland Suspected NEW Heart Failure Patient Diagnostic Pathway**

○=GP or cardiac physiologist   ●=cardiologist   \*=standard letter   \*\*=info from referral form

**Patient has reasonable clinical suspicion of heart failure + one of the following at time of referral**

- New onset breathlessness
- Ankle oedema
- Dyspnoea on exertion/rest
- Orthopnoea
- Fatigue/tiredness (with 1 of the above)

NB symptoms may not be present at diagnostic appointment if on trial of diuretic.

**Pre-referral**  
History including previous cardiac history and examination to exclude red flag signs and symptoms.  
Tests required:  
Full blood count (for anaemia), TFTs  
U&Es (for creatinine)  
CXR

**If none of these but clinical suspicion of heart failure, please refer to cardiology clinic**

**RED FLAG SYMPTOMS:**

- Paroxysmal nocturnal dyspnoea
- Lung crepitations

Symptoms severe enough for admission

YES

Consider hospital admission

NO

Relevant signs and/or symptoms

Check symptoms/signs on referral form\*\*

CHF diagnostic service

ECG

No relevant symptoms or signs

Return to GP for review of issues\*

No ECG abnormalities or other indications for echo (see below)

ECG shows BBB, Q wave, LVH, AF  
OR male+ankle oedema\*\*  
OR previous MI\*\*

**Abnormal BNP**  
F (no ankle oedema\*\*) >110pg/ml  
F (+ankle oedema\*\*) >55pg/ml  
M (no ankle oedema\*\*) >70pg/ml

Perform BNP (B-Type Natriuretic Peptide) test

Normal BNP

Obtain echocardiogram

Cardiologist to identify underlying cause and any appropriate intervention

Confirmed left ventricular systolic dysfunction (LVSD)

GP for management as per local guidelines\*

No LVSD

Personalised management plan

Personalised management plan

**RETURN to GP**  
**Confirm heart failure extremely unlikely – other cause of symptoms should be sought\***

If HF still considered likely try response to furosemide.

If improvement refer to cardiology clinic

If no improvement, HF very unlikely.

# Primary care pre-referral

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## Pre-referral

History including previous cardiac history and examination to exclude red flag symptoms/signs.  
Tests required:  
Full blood count (for anaemia),  
TFTs  
U&Es (for creatinine)  
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## RED FLAG SYMPTOMS/SIGNS:

- Paroxysmal nocturnal dyspnoea
- Lung crepitations



Symptoms severe enough for admission

Admit



YES



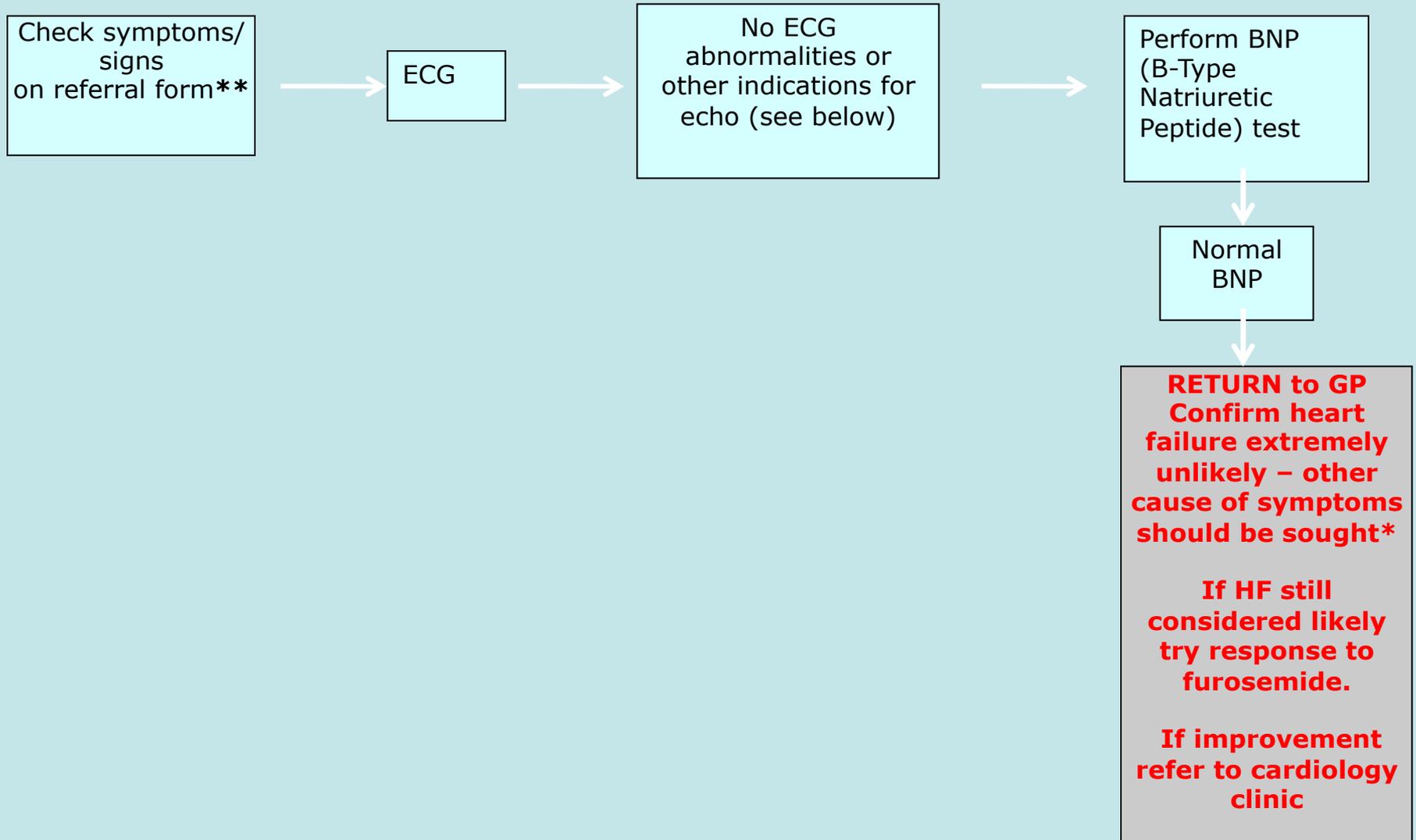
NO



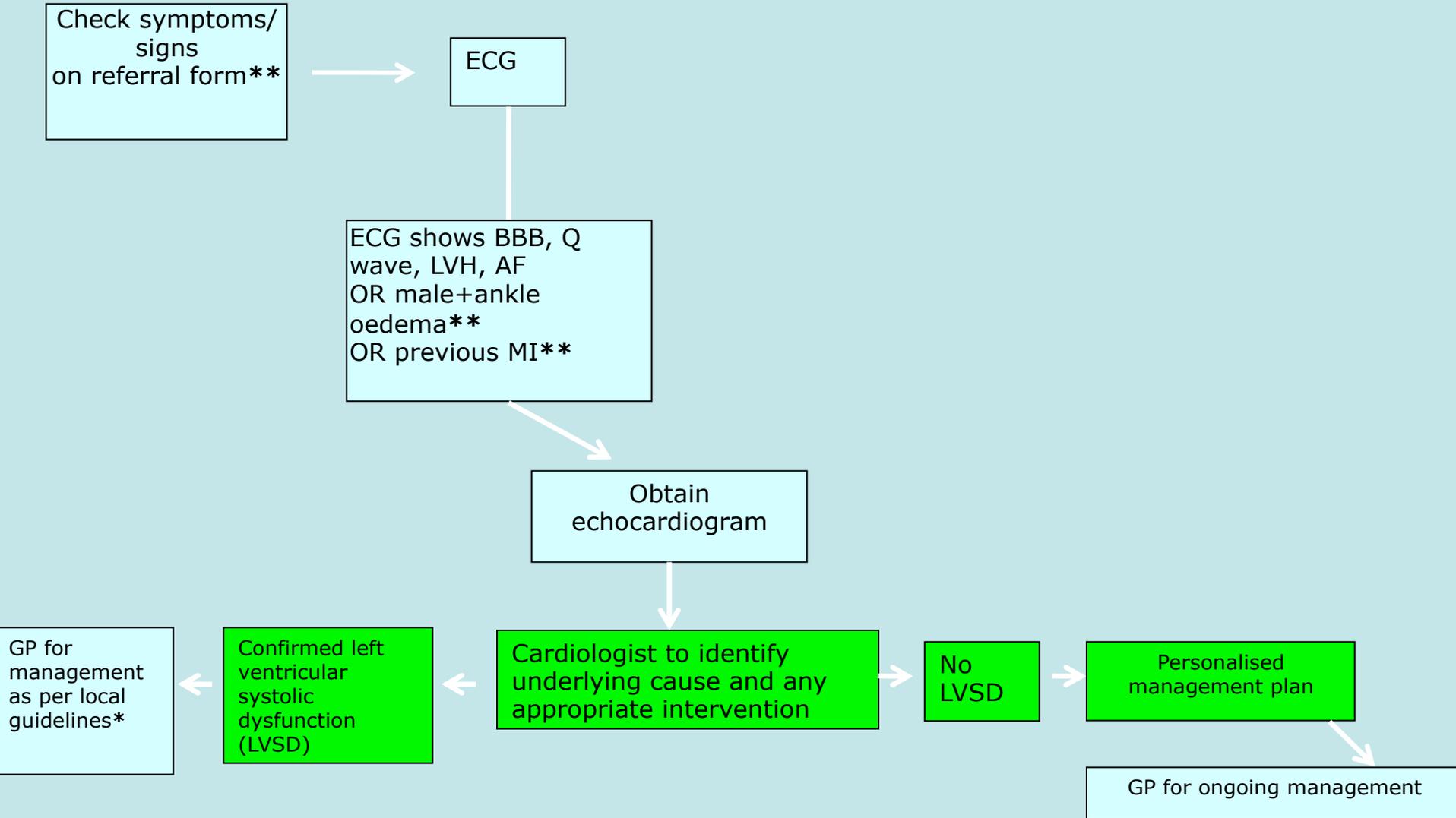
CHF diagnostic service



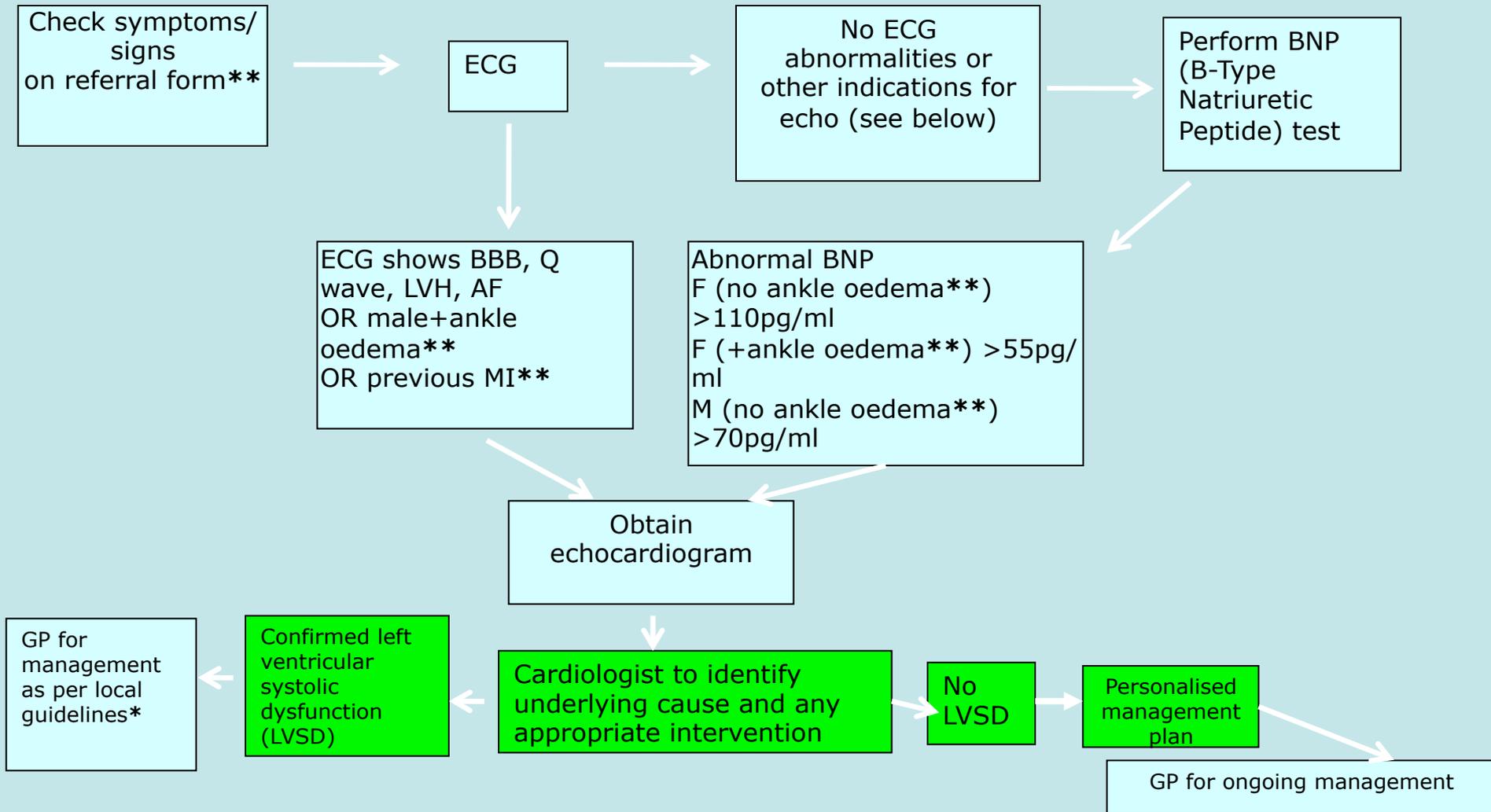
# Normal ECG



# Abnormal ECG



# Normal ECG, Raised BNP



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# Results

- Western Infirmary, Victoria Infirmary, Glasgow Royal Infirmary, Southern General Hospital, Stobhill Hospital, Royal Alexandra Hospital
- April 2011 to March 2012 (Victoria April 2010 to March 2012)
- 848 referrals
- 53 “Did not attend”
- 1 admitted to hospital before entering the pathway

# Abnormal ECG

- 323 ECG and Echo
- 49 Confirmed LVSD,
  - 3 Echo review and management plan,
  - 35 echo review and cardiology appointment,
  - 11 referred back to GP,
  - 13 referred to HFNLS

# Normal ECG, Normal BNP

- 278 normal ECG and BNP
- 8 cardiology appointment
- 270 referred back to GP

# Normal ECG, Abnormal BNP

- 197 ECG normal, abnormal BNP and Echo performed
- 16 confirmed LVSD
- 1 admitted to hospital
- 3 echo reviewed and management plan made
- 11 echo reviewed and cardiology appointment made
- 2 referred back To GP
- 1 referred to HFNLS

# “Savings”

- 794 potential echocardiograms
- 794 cardiology appointments?
- 520 performed
- “saving” of 274 echocardiograms

# Pick up rate

- 794 attenders
- 65 had LVSD
- 8% of attenders

# Is it safe?

- During a median follow up of 286 days there were no re-attendances at outpatients or admissions for HF in those identified as not having LVSD by the pathway during the pilot

# Planning

- Devised to ensure all HF patients were quickly diagnosed seen by a specialist and given an appropriate management plan
- Direct access echo service is over subscribed, does not involve a specialist, no access to therapy or services
- Using BNP as a rule out a number of echos could be avoided
- Original pathway constructed by HD MCN lead clinician and 2 consultant cardiologist (HF specialists – IF and MCP)
  - Modelled on National Patient Pathways centre for change and innovation pathway
- Pathway then reviewed by HF sub group and physiologists

# Planning

- Changes to draft pathway made
  - Physiologists checking symptoms
  - Patients without LVSD management
- Costs for BNP tests to be funded on a recurring basis by the HD MCN (£36,000 pa)
- Savings to be made by the reduction in echos carried out
- Possible additional savings
  - patients being on the correct management plan earlier and reduction in future admissions

# Planning

- BNP testing discussed with biochemistry.
  - Near patient testing ruled out, labs give a 2 hour maximum wait guarantee
- Patient consultation over whether they would prefer:
  - 2 hour wait and same day echo OR
  - to return with a new appointment

# Planning

- Lower grade physiologists trained to do phlebotomy work for BNP tests.
- GP education evenings run to launch the service.
- Audit and report made on the outcomes of initial pilot
- Roll out timetable and training needs identified at all other sites
- HFDP rolled out to all sites.

# Summary

- The new pathway reduces the time to diagnosis or rule out of HF
- Potential cost savings
- Reduction in the number of echos performed
- Patients with HF reviewed by specialists
- Appears safe
- Requires planning – stakeholders, support staff, labs, training

**Thank you  
and  
questions**