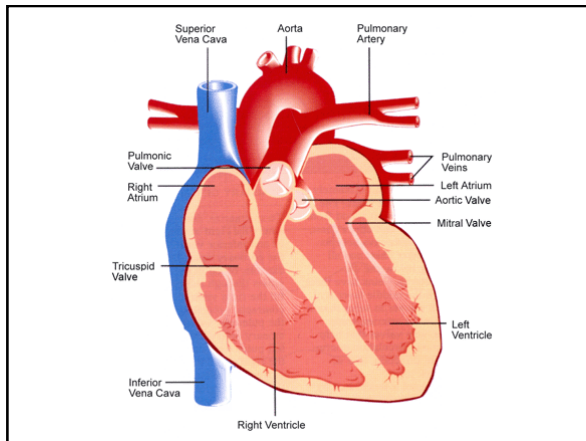




Heart failure

An overview of heart failure

- **Background to heart failure**
 - Definition, epidemiology, causes, signs & symptoms
- **Diagnosis & management of heart failure**
 - Pharmacological management
 - Self-care, lifestyle measures
- **Palliative care needs**
- **Role of the pharmacist**



What is heart failure?

- **A complex clinical syndrome of symptoms and signs that suggest the efficiency of the heart as a pump is impaired**
- **Caused by structural or functional abnormalities of the heart**
- **Most common is damage to the left ventricular muscle**

Types of heart failure

- **Acute heart failure**
 - Rapid sudden onset of symptoms
- **Chronic heart failure**
 - Heart failure with left ventricular systolic dysfunction (LVSD)
 - Heart failure with preserved ejection fraction (HFPEF)

Epidemiology of heart failure

NICE Full clinical guideline 108; National Heart Failure Audit 2010

- **Around 900,000 people with heart failure in the UK**
- **Prevalence increases steeply with age**
 - 1 in 35 aged 65-74
 - 1 in 15 aged 75-84
 - 1 in 7 aged 85+
- **On average, a GP will look after 30 people with heart failure and will suspect a new diagnosis of heart failure in 10 people annually**

Epidemiology

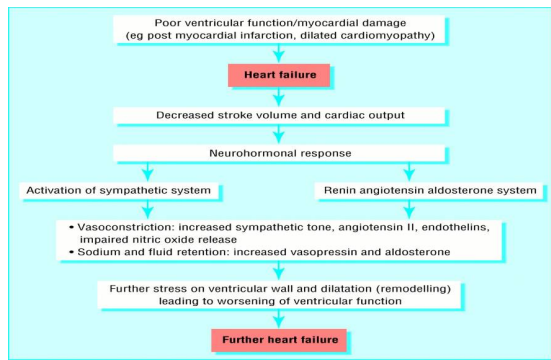
NICE Full clinical guideline 108; National Heart Failure Audit 2010

- **Burden of heart failure is increasing**
 - Ageing population; improved survival from IHD
- **Prognosis worse than most cancers**
 - 30-40% of patients will die within a year of diagnosis
- **Major impact on QOL:**
 - > one-third of patients experience depression
- **Impact on services**
 - Around 2% of total NHS budget (70% due to hospitalisations)
 - Burden on social services, patients and carers

Common causes

- **Coronary artery disease is the most common cause (approximately 70%)**
- **Hypertension**
- **Atrial fibrillation**
- **Diabetes**
- **Valve disease**
- **Heart damage e.g. dilated cardiomyopathy**
- **Other causes, e.g. pregnancy, drugs, alcohol, thyrotoxicosis**

So what is going on?



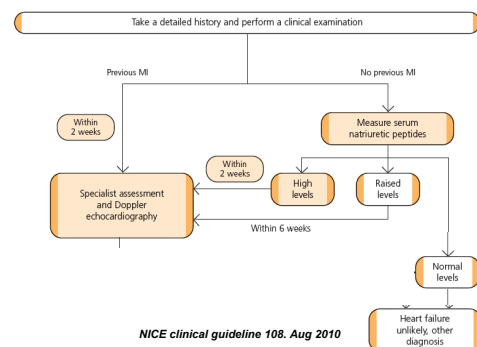
Signs and symptoms

- **Breathlessness**
 - Dyspnoea
 - Orthopnoea
 - Paroxysmal nocturnal dyspnoea (PND)
- **Fatigue**
- **Exercise intolerance**
- **Fluid retention**
 - Ankle swelling
 - Abdominal swelling

Diagnosing heart failure

- **Individual signs and symptoms are poorly predictive**
- **Brain Natriuretic Peptide (BNP)**
 - Blood test that can be carried out in general practice
 - Patients are unlikely to have HF if they have a normal BNP level
- **Echocardiography if BNP or ECG abnormal**
 - Assessment of ventricular function

Diagnosing heart failure



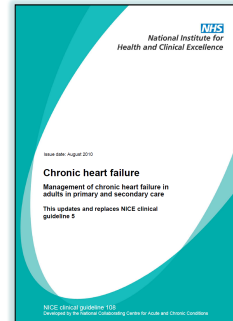
NICE clinical guideline 108. Aug 2010

NYHA classification

CKS Guidance. Heart failure – chronic. Updated 2010

Class	Symptoms
I	No limitations. Ordinary physical activity does not cause fatigue, breathlessness or palpitation (asymptomatic LVD included in this category)
II	Slight limitation of physical activity. Comfortable at rest. Ordinary physical activity results in fatigue, palpitation, breathlessness or angina (symptomatically 'mild' heart failure)
III	Marked limitation of physical activity. Although comfortable at rest, less than ordinary physical activity will lead to symptoms (symptomatically 'moderate' heart failure)
IV	Inability to carry out any physical activity without discomfort. Symptoms of congestive cardiac failure are present even at rest. With any physical activity, increased discomfort is experienced (symptomatically 'severe' heart failure)

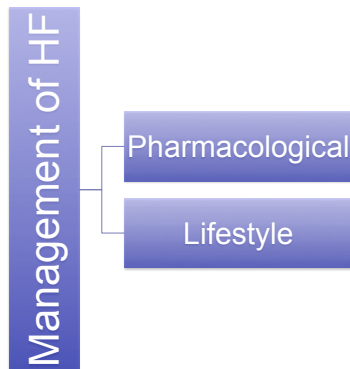
Management of heart failure



Management of heart failure

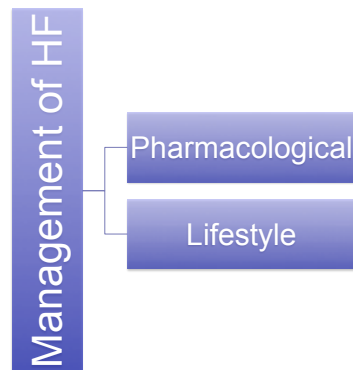
NICE clinical guideline 108, Aug 2010

- Patient centred care
- Good communication - informed decisions
- Multidisciplinary approach to care
- Advise patients of local support networks
 - Community heart failure nurse specialists
 - British Heart Foundation
 - www.bhf.org.uk
 - N. Ireland Chest, Heart and Stroke
 - www.nichsa.com
- Consider palliative care needs



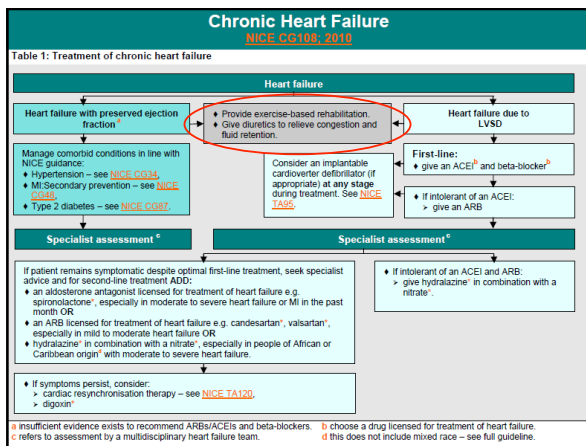
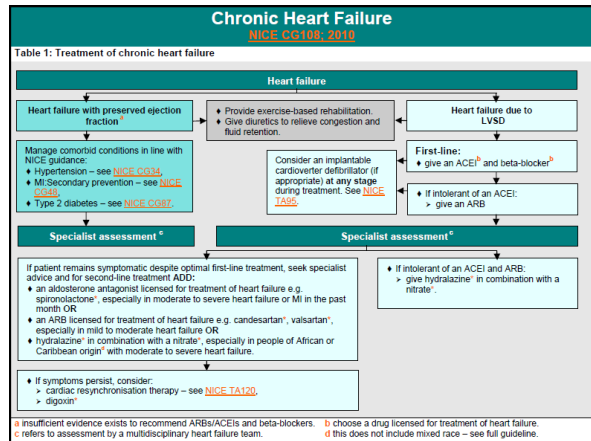
Aims of treatment

- Relieve symptoms and increase quality of life
- Reduce, delay or avoid complications:
 - Sudden death and ischaemic events
 - Hospital admissions
 - Arrhythmias (AF and ventricular)
 - Stroke and thromboembolism
- Tackle associated issues:
 - Underlying causes or complicating co-morbidities
 - Depression
- All with a minimum of adverse effects



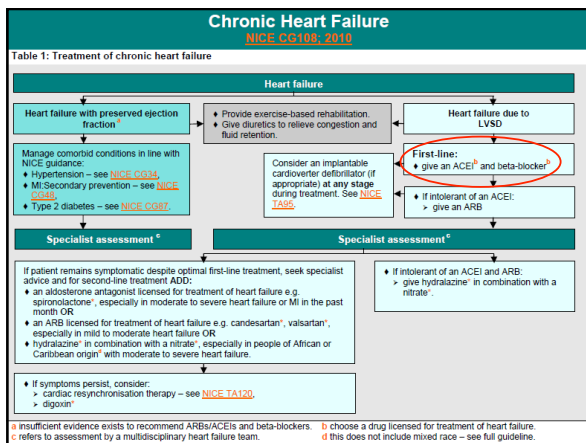
Pharmacological treatments

- Historically treatments driven by symptomatic therapy
 - Diuretics and digoxin
- Major advances with newer agents
 - Primarily focused on patients with heart failure with LVSD
 - Mortality and morbidity rates have fallen
 - HFPEF (HF with Preserved Ejection Fraction)
 - Further research required



Diuretics

- Symptomatic treatment of fluid overload
 - Pulmonary congestion or peripheral oedema
- Loop, thiazide and potassium sparing diuretics
- Diuretics improve symptoms and exercise performance
- Common practice to initiate at low doses and titrate (up and down) to control fluid retention
- A loop diuretic is usually necessary
- Caution with potassium-sparing diuretics and ACEIs or A2RAs – risk of hyperkalaemia
- Combinations sometimes required (metolazone)



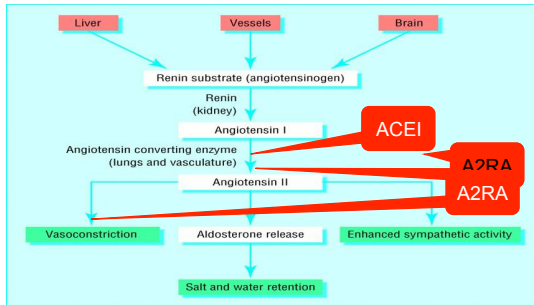
First line treatments: Beta-blockers and ACE inhibitors

NICE CG 108, August 2010

- Both ACE inhibitors and beta-blockers licensed for heart failure should be offered to all patients with heart failure due to left ventricular systolic dysfunction
- Use clinical judgement when deciding which drug to start first

The renin system in heart failure

BMJ 2000; 320: 167-170



... but we can't assume that blocking the same biochemical pathways will generate the same patient orientated outcomes ...

Evidence for ACE inhibitors in HF

ESC Heart Failure Guidelines 2008

- 'Treatment with an ACE inhibitor improves ventricular function and patient well-being, reduces hospitalisation for worsening HF, and increases survival.'
- Key trials:
 - SOLVD: Treatment of mild to moderate HF, enalapril vs. placebo
Mortality RRR 16% (NNT=22 over 41 months)
 - CONSENSUS: severe HF, enalapril vs. placebo
Mortality RRR 27% (NNT=7 over 6 months)
- ACE inhibitors also improve symptoms, exercise tolerance, quality of life and exercise performance

Initiating ACE inhibitors

- Start at low dose and titrate upwards at short intervals until the optimal tolerated or target dose is achieved
- Aim for target doses, if tolerated
 - Some ACE inhibitor is better than no ACE inhibitor
- Measure serum urea, creatinine, electrolytes and eGFR at initiation and after each dose adjustment

Angiotensin-2-receptor antagonists (A2RAs)

- Either as an alternative to first-line ACE inhibitor therapy for patients who experience intolerable side-effects
- Or as an add on, second-line treatment option (on specialist advice) if symptomatic despite optimal therapy with a beta-blocker and an ACE inhibitor
 - Especially if have mild-moderate HF
- Monitor serum urea, electrolytes, creatinine and eGFR

Northern Ireland Regional Prescribing Policy on Angiotensin Converting Enzyme (ACE) Inhibitors and Angiotensin – II Receptor Antagonists (A-IIRAs)

Guidance on choice of ACE inhibitors and AIIARs in Primary and Secondary Care

This guideline on ACE inhibitors and AIIARs has been developed by an expert group to recommend suitable first line agents for the treatment of common therapeutic indications.

The ACE inhibitors recommended by the expert group are:

- Lisinopril
- Perindopril
- Ramipril

These represent suitable first line choices for the majority of clinical indications and are supported by clinical trial data. The AIIARs should be reserved for patients who are truly intolerant to ACE inhibitors in all of the therapeutic areas covered by this guidance (due to the greater evidence base and supportive data for ACE inhibitors).

The AIIARs recommended by the expert group are:

- Canesartan
- Losartan
- Valsartan

Recommended choices for common therapeutic areas suggested by the evidence base, for patients requiring therapy for 2 or more disease areas, select a drug recommended for both indications.

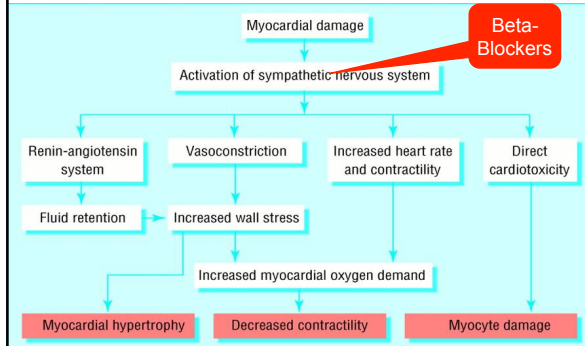
Indication	ACE Inhibitor	AIIARA option - if patient cannot tolerate ACE inhibitor
• Hypertension	• Lisinopril or • Perindopril or • Ramipril	• Canesartan or • Losartan or • Valsartan
• Coronary Artery Disease	• Perindopril or • Ramipril	• No major supportive data yet
• Heart Failure	• Lisinopril or • Ramipril	• Canesartan or • Valsartan
• Chronic Kidney Disease	• Lisinopril or • Ramipril	• No major supportive data yet

Lower starting doses may be required in the presence of renal impairment or in patients with a severely activated renin-angiotensin-aldosterone system. Refer to the SPC for further information. In chronic kidney disease (CKD), lower doses of treatment and titration are available if appropriate.

First-line treatment: Beta-blockers

- Previously contra-indicated in HF
- Now first line agents
- Improve symptoms, increase life expectancy and reduce hospitalisations in all grades of heart failure due to LVSD
- Benefits of beta-blockers may not be a class effect
 - Four have evidence of effectiveness
 - 3 licensed — bisoprolol, carvedilol, nebivolol
 - 1 unlicensed — metoprolol succinate

Beta-blockers in chronic HF



Beta-blockers

- Improve symptoms, reduce hospitalisations, increase survival
- Introduce in a 'start low, go slow' manner, and assess heart rate, BP and clinical status after each titration
- Associated side effects include hypotension, dizziness and bradycardia
- Stable patients who are already taking a beta-blocker for a co-morbidity and who develop heart failure due to LVSD should be switched to a beta-blocker licensed for heart failure

Target doses: Beta-blockers

Crest Guidelines 2005, BNF 2011

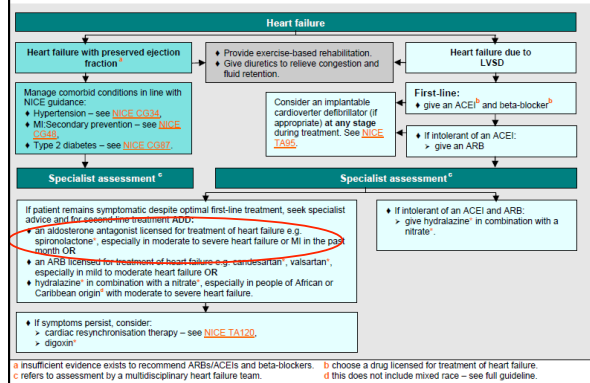
	Starting dose (mg)	Target dose (mg)
Bisoprolol	1.25mg once daily	10mg once daily
Carvedilol	3.125mg twice daily	25-50mg twice daily
Nebivolol	1.25mg once daily	10mg once daily

'Beta-blockers are being underused'
National Heart Failure Audit 2010

Chronic Heart Failure

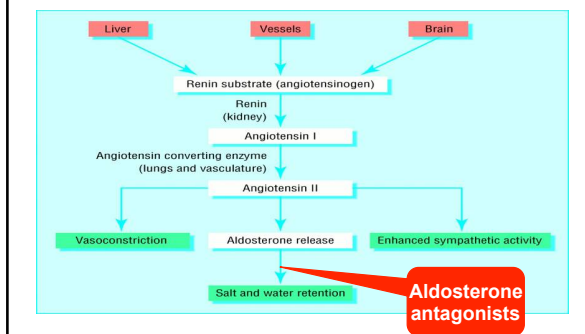
NICE CG108, 2010

Table 1: Treatment of chronic heart failure



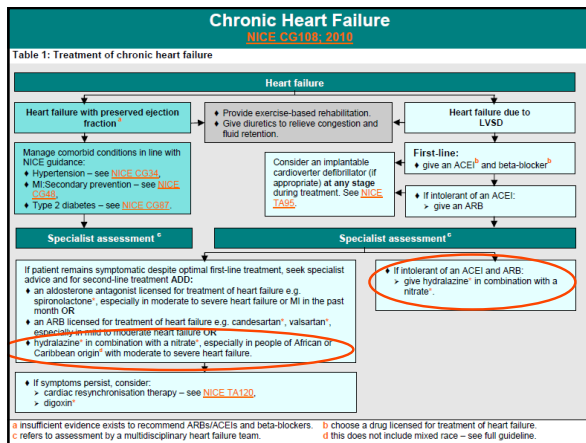
Aldosterone antagonists

BMJ 2000; 320: 167-170



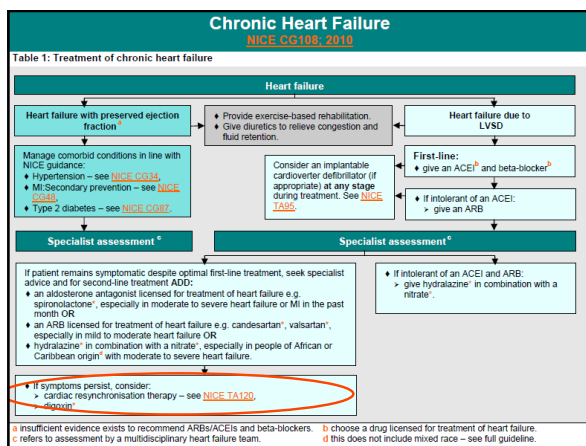
Aldosterone antagonists

- Specialist option for second line treatment
 - Especially in moderate-severe HF (NYHA class III-IV) or MI in past month
 - Spironolactone 25mg daily reduces hospitalisations and increases life expectancy
- Associated side-effects include hyperkalaemia and renal impairment
 - Closely monitor K⁺, creatinine and eGFR
 - Avoid 'OTC' NSAIDs
- Eplerenone more selective
 - alternative to spironolactone in gynaecomastia



Second-line therapy: ISDN /hydralazine combination

- Isosorbide dinitrate (veno-dilator) + hydralazine (arterial dilator)
- Combination extends life-expectancy:
 - But not as well as ACE inhibitors
- Further evidence of benefit in black population
 - Black patients have less renin and less response to ACE inhibitors
- Seek specialist advice
 - Alternative first-line treatment for patients who are intolerant of ACE inhibitors and A2RAs
 - Second-line treatment option in black people with moderate to severe HF



Digoxin

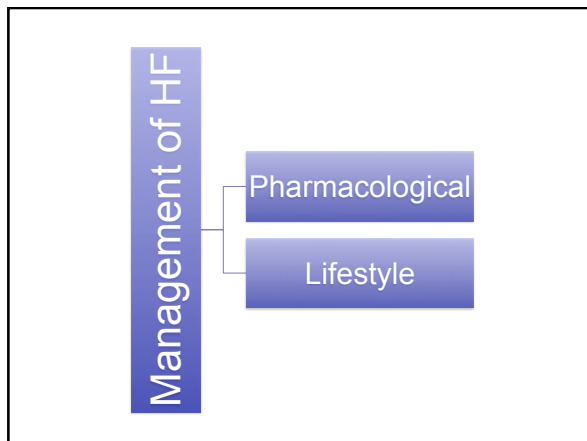
- Mode of action
 - Increases the force of myocardial contraction and reduces conductivity within AV node
- Benefits
 - Less clinical deterioration
 - Lower rates of hospitalisation
 - No mortality benefit

Digoxin: role in therapy

- Limited role now
 - worsening or severe heart failure due to LVSD despite 1st and 2nd line treatments
 - patients with symptomatic **HF and AF**
- Routine measurement of serum digoxin is not recommended; consider checking when:
 - adverse effects suggestive of toxicity
 - when other factors may affect digoxin levels
 - poor compliance

Cardiac resynchronisation

- Indicated for heart failure caused by dilated cardiomyopathy
- Specialised pacemaker to re-coordinate the action of the right and left ventricles
- Indicated for patients NYHA III-IV, symptomatic and evidence of dysynchrony of ventricles
- Improve symptoms and exercise capacity, general well-being and survival



Lifestyle advice (I)

- **Keep active and do physical exercise**
 - Safe and beneficial if does not exceed the person's capacity
 - Cardiac rehabilitation if suitable and available should be considered
- **Stop smoking**
 - Offer referral to smoking cessation service
- **Advise on alcohol intake**
 - Prudent use generally recommended
 - Abstinence in alcohol-related heart failure

Lifestyle advice (II)

- **Diet**
 - Ensure adequate general nutrition
 - Weight reduction in overweight patients
 - Restrict salt consumption; avoid salt substitutes that are high in potassium
- **Avoid excessive fluid intake**
 - Restrict to 1.5-2L per day
 - Advice on symptoms of dehydration
- **Vaccination**
 - Influenza and pneumococcal vaccines recommended

Lifestyle advice (III)

- **Sexual activity**
 - Provided the symptoms of heart failure are well controlled sexual activity is not contra-indicated
- **Driving**
 - Clear guidance from DVLNI
 - Usually only affected if patient has a device fitted e.g. ICD
- **Air travel**
 - Most people with heart failure can safely travel by air, provided that their condition is stable

Monitoring: Clinical review

- **Monitoring of patient should include:**
 - Assessment of functional capacity, fluid status, cardiac rhythm, cognitive status and nutritional status
 - Review of medication
 - Serum urea, electrolytes, creatinine and eGFR
- **Frequency depends on clinical status and stability of patient**
 - Days to two weeks.....6 monthly

Monitoring: Self-monitoring

- **Symptom recognition**
 - Breathlessness, tiredness, ankle or abdominal swelling, rapid weight gain
 - If symptoms deteriorate, patients should seek medical advice and/or increase diuretic dose
- **Weight management**
 - Regular measurement (e.g. daily) may detect worsening heart failure early
 - Rapid gain in weight (e.g. >2kg in 3 days) may indicate fluid retention
 - Seek medical advice and/or increase diuretic dose and/or reduce fluid intake

Palliative care and HF

- A progressive clinical syndrome despite therapeutic advances
- Greatest negative impact on quality of life
- Prognosis worse than for many forms of cancer
 - 50% of all patients with heart failure die within 4 years
 - 50% of those with grade IV heart failure die within 1 year

Palliative care and HF

Pain	78%
Dyspnoea	61%
Low mood	59%
Insomnia	45%
Anorexia	43%
Constipation	37%
Nausea/vomiting	32%
Anxiety	30%
Urinary incontinence	29%
Mental confusion	27%
Faecal incontinence	16%

Clinical indications for referral to palliative care services

- NYHA III or IV
- Recurrent hospital admission for symptomatic heart failure despite optimum tolerated therapy
- Difficult physical or psychosocial issues
- ‘Would I be surprised if the patient died in the next 12 months?’

Role of the pharmacist in HF

“Patients with chronic heart failure report high levels of frustration with progressive loss of function, social isolation and the stresses of monitoring a complex medical regimen.”

SIGN Guideline 95. 2007

Role of the pharmacist

- Ensuring evidence-based therapy
 - Reduction of mortality/hospitalisations
 - Dose optimisation
- Polypharmacy is the norm
 - Co-morbidities
 - ADRS, drug interactions
 - Poor medicines adherence
- Patient and carer education

Role of the pharmacist

How to integrate pharmacists into interdisciplinary care to improve outcomes?

- Medicines management
 - Intervention schemes e.g. MYM
 - Practice-based pharmacists
- Repeat dispensing
- Specialist roles
 - Clinical pharmacists
 - Pharmacist prescribers

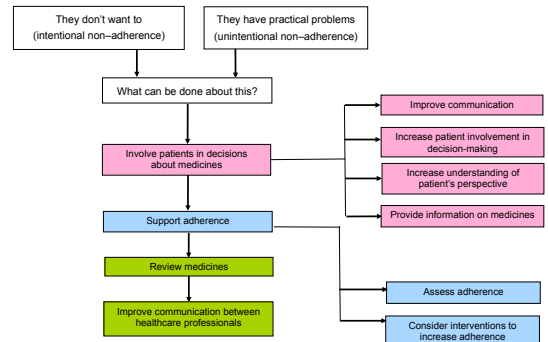
Medicines adherence

- **Non-adherence is a significant cause of re-admission in patients with heart failure**
- **Dosing regimens should be kept as simple as possible, and the healthcare professional should ensure that the patient and carer are fully informed about their medication**

NICE Clinical Guideline 108, August 2010

- **'Medicines adherence: involving patients in decisions about prescribed medicines and supporting adherence'** NICE clinical guideline 76 2009

Why do some patients not take their drugs as prescribed?



Medicines management

- **Non-CHF medicines**
 - NSAIDs
 - Calcium channel blockers
 - Lithium
 - Tricyclic antidepressants
 - Glitazones
 - Herbal medicines
 - St John's wort