Ferinject® is clinically effective and significantly superior to iron sucrose 1
Ferinject®’s carboxymaltose shell is dextran free 2-5
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References:
2. Qunibi WY. Arzneimittelforschung 2010; 60(6a): 399-412.
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*The meeting has been awarded 11 study hours and the reference is 5199.*

*The event is accredited by the Royal College of Physicians. The meeting has been awarded 11 credits and the reference is 68353.*

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Please note that photography, video and audio recording of the sessions and slides of this meeting is strictly prohibited.

British Society for Heart Failure, ‘Nought’ The Farthings, Marcham, Oxfordshire, OX13 6QD  
Tel: 01865 391836 Email: info@bsh.org.uk Website: www.bsh.org.uk

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Advance notice

4th BSH Medical Training Meeting
9 February 2012, Wellcome Trust, London

This training day programme has been designed by Dr Suzanna Hardman and Dr Simon Williams to meet the educational needs of the heart failure component of the core curriculum in cardiovascular medicine, as well as the needs for advanced training in heart failure. It will provide an in-depth discussion around particularly challenging and often controversial management issues that will be relevant to trainees in internal medicine, care of the elderly specialists and GPs with a special interest in heart failure. The day has been structured to provide a balance of carefully selected talks and interactive case based sessions.

BSH Heart Failure Nurse Study Day
10 February 2012, Wellcome Trust London

This is the second year we will be holding this study day. It is designed to educate and interest heart failure nurses and will be of interest to nurses, both early in their role and those with more experience. The day aims to provide evidence-based knowledge from leading UK specialists in heart failure management, and in-depth discussion of particularly challenging and controversial management issues facing nurses caring for patients with heart failure.

European Heart Failure Awareness Day
11 May 2012

This is a Europe-wide day to raise the awareness of heart failure. The initiative is led by the European Society of Cardiology (ESC)/Heart Failure Association (HFA) and is supported by the BSH. More details will be available shortly and we would be pleased to hear of the activities you might be planning locally.

British Cardiovascular Society Annual Conference
28–30 May 2012, Manchester Central, Manchester

The BSH will be involved with heart failure-related sessions at the conference.

15th BSH Annual Autumn Meeting 2012
29–30 November 2012, Queen Elizabeth II Conference Centre, London

For more information about the above events, including detailed programmes/registration forms, please visit the BSH desks in the exhibition area or www.bsh.org.uk
The BSH is grateful to the following for meeting-specific contributions:

**Gold exhibitors:**
- GE Healthcare
- Pfizer
- Vifor Pharma

**Silver exhibitors:**
- Edwards Lifesciences
- Novartis
- Servier

**Bronze exhibitors:**
- Alere
- Boston Scientific
- Gambro Lundia
- HeartWare
- NHS Improvement
- ResMed UK
- Roche Diagnostics
- Takeda
- Thoratec

**Other contributors:**
- National Institute for Cardiovascular Outcomes Research (NICOR)
- Wisepress

We also welcome support from the British Heart Foundation

The BSH also gratefully acknowledges the support provided by the Friends of BSH:
- Alere
- Edwards Lifesciences
- GE Healthcare
- HeartWare
- Medtronic
- Pfizer
- Servier Laboratories
- St Jude Medical
- Takeda
- Thoratec
- Vifor Pharma
Programme – Day One  THURSDAY 24 NOVEMBER 2011

Programme director: Andrew Clark (Hull)

09:00  Registration – Tea / Coffee

09:30–11:00  Session 1: Individuals vs the bureaucracy
Chairs: Andrew Clark (Hull) / Suzanna Hardman (London)

09:30–09:50  The National Audit
Theresa McDonagh (London)

09:50–10:10  The new landscape and heart failure
Nigel Rowell (Middlesbrough)

10:10–10:30  Hospital perspective
Suzanna Hardman (London)

10:30–10:50  Primary care perspective
Annie MacCallum (Gloucestershire) / Jim Moore (Cheltenham)

10:50–11:00  Panel discussion

11:00–11:30  Coffee

11:30–12:30  Session 2: Individual problems: the patient with heart failure and…
(part-supported by an educational grant from Vifor Pharma)
Chairs: Martin Cowie (London) / Annie MacCallum (Gloucestershire)

11:30–11:45  Lung disease
Nat Hawkins (Liverpool)

11:45–12:00  Renal impairment
Paul Kalra (Portsmouth)

12:00–12:15  Diabetes
Chim Lang (Dundee)

12:15–12:30  Great age
John Baxter (Sunderland)

12:30–14:00  Lunch and Meet the Expert sessions

14:00–15:30  Session 3: Individual patients: lifestyle
Chairs: Theresa McDonagh (London) / Iain Squire (Leicester)

14:00–14:20  Flying
William Toff (Leicester)

14:20–14:40  Exercise
Andrew Clark (Hull)

14:40–15:00  Sex
Michael Kirby (Hatfield)

15:00–15:20  Pregnancy
Lorna Swan (London)

15:20–15:30  Discussion

15:30–16:00  Coffee

16:00–18:00  Session 4: Individual patients: genetics
Chairs: Ahmet Fuat (Darlington) / Paul Kalra (Portsmouth)

16:00–16:30  Genetics and heart failure
Edward Blair (Oxford)

16:30–17:00  Who to investigate and how
Gerry Carr-White (London)

17:00–18:00  Philip Poole-Wilson Lecture:
John Burn (Newcastle upon Tyne)
10 things Mendel missed

18:00–19:00  Wine and cheese reception
Programme – Day Two  FRIDAY 25 NOVEMBER 2011

09:00–09:25  BSH Annual General Meeting (BSH members only)
Chairs:  Suzanna Hardman (London) / Paul Kalra (Portsmouth)

09:30–11:00  Session 5: Individual patients: case histories
(part-supported by an educational grant from Vifor Pharma)
Panel:  Martin Cowie (London) / Jim Moore (Cheltenham)

09:30–09:50  Case study  Jayne Masters (Southampton)
09:50–10:10  Case study  Ahmet Fuat (Darlington)
10:10–10:30  Case study  Lindsey Tilling (London)
10:30–10:50  Case study  Katie Longton (London)
10:50–11:00  Discussion

11:00–11:30  Coffee

11:30–12:30  Session 6: The individual experience
(supported by an educational grant from Pfizer)
Chairs:  John Baxter (Sunderland) / Jane Butler (London)

11:30–11:45  Living with heart failure  Richard Mindham (London)
11:45–12.05  Many stories  Jenny Welstand (Wrexham)
12:05–12:20  The great success of medicine  Andrew Clark (Hull)
12:20–12:30  Panel discussion

12:30–14:00  Lunch and Meet the Expert sessions

14:00–15:30  Session 7: Advanced therapy
(supported by an educational grant from GE Healthcare)
Chairs:  John Cleland (Hull) / Tom Treasure (London)

14:00–14:20  The need for advanced therapy  Henry Dargie (Glasgow)
14:20–14:40  Assessment for advanced therapy  Simon Williams (Manchester)
14:40–15:00  LVADs – the future?  Nick Banner (London)
15:00–15:30  Surgical approaches in advanced heart failure  Steven Tsui (Papworth)

15:30–16:00  Coffee

16:00–17:15  Session 8: Success and the future
Chairs:  Andrew Clark (Hull) / Henry Dargie (Glasgow)

16:00–16:30  The top five clinical trials  John Cleland (Hull)
16:30–17:00  Is there a future for heart transplantation in the UK?  Guy MacGowan (Newcastle upon Tyne)
17:00–17:15  Commentary on the future for heart transplantation in the UK  Tom Treasure (London)

17:15  Meeting close
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The National Audit

Theresa McDonagh
Royal Brompton Hospital, London

There is no abstract for this session.

The new landscape and heart failure

Nigel Rowell
Endeavour Practice, Middlesbrough

Never before in the history of the NHS are we being asked to do so much more with so much less. A Waitrose shop with a Netto budget.

Although rationing should be undertaken at many different levels in the NHS organisation, including politicians, in reality it nearly always comes down to local GPs and local trusts. The potential for a postcode lottery is obvious.

The Cardiac Networks have the potential to limit the damage done by this. We are promised clinically led commissioning where GPs will work alongside consultants to provide the best care available for the money. The truth, of course, is likely to involve some conflict and it is this that will always make the headlines.

To have true clinical commissioning we will need GPs to be willing to educate themselves and up-skill, and we will need help from our consultant colleagues to criticise in a positive way and assist in designing value-for-money pathways. We need to work together in a payment system designed to keep us apart.

NHS Improvement has demonstrated in its projects how successful change can be brought about on your local turf. With over 122 sets of NICE guidance the job of the generalist is becoming ever more taxing. New technologies for the specialist are harder and harder to fund.

The landscape is indeed changing.
Hospital perspective
Suzanna Hardman
Whittington Hospital, London

To date hospital care for the individual with heart failure has been extremely variable and this has been reflected in the messages emerging from the heart failure audit, though improvements have been seen year on year. Irrespective of the political and financial landscape, our duty as clinicians is to implement evidence-based care at its best – with revised NICE guidance for chronic heart failure and the related NICE quality standards there are opportunities to achieve this for every individual patient. I will describe the delivery of acute care including the need for more heart failure specialists and the likely implications of that care.

I will explore the possible impact of mergers, competing hospitals, A and E closures, the integrated care organisation, encompassing comprehensive care for all from acute presentation to rehabilitation, and centralising care, and give a guide as to how to stay ahead amidst so much change whilst retaining some sanity! And I aspire to achieve all this without repetition, deviation or breaching the time allocation.

Primary care perspective
Annie MacCallum / Jim Moore
Gloucestershire PCT / Stoke Road Surgery, Bishops Cleeve, Cheltenham

These are changing and challenging times within the NHS, not least in primary care. One year on from the publication of the National Institute for Health and Clinical Excellence (NICE) chronic heart failure guideline (partial update), the provision of specialised care for patients with heart failure continues to vary significantly. Despite the uncertainty regarding the final detail within the cautiously anticipated Health and Social Care bill, the impending demise of current primary care organisations is accepted and major structural reorganisation is already under way. Surviving primary care-based heart failure services are on the move, with many being reconfigured within new social enterprise organisations such as Care Services Community Interest Companies, with attendant concerns around the nature of their future deployment.

The need for increasing financial prudence will lead the new NHS commissioners in clinical commissioning groups to consider, within the context of NICE Quality Standards, both the need for, and cost effectiveness of, existing heart failure services, with increasing consideration given to the services offered by non-NHS providers.

The future landscape remains far from clear!
The combination of heart failure and chronic obstructive pulmonary disease (COPD) presents both diagnostic and therapeutic challenges. Clinical symptoms and signs frequently overlap. Evaluation of cardiac and pulmonary function may be problematic. The cornerstones of therapy are beta-blockers and beta-agonists, respectively. Their pharmacological effects are diametrically opposed, and each is reported to adversely affect the alternative condition.

A Cochrane Library meta-analysis evaluated pulmonary function in 20 small, randomised, controlled, crossover trials of cardioselective beta₁-blockers in patients with COPD. Although the evidence has limitations, the meta-analysis concluded that cardioselective beta-blockade is safe and well tolerated in COPD, even among patients with severe or reversible airflow obstruction. The long-term impact of beta-blockade on pulmonary function, symptoms, and quality of life is unclear. However, the small risk of adverse events is outweighed by proven reductions in morbidity and mortality. In observational studies, use of beta-blockers is consistently associated with better survival in patients with heart failure and concurrent COPD. Accordingly, both the European Society of Cardiology (ESC) guidelines and National Institute for Health and Clinical Excellence Clinical Guideline 108 clearly state that COPD is not a contraindication to beta-blockade. Low dose initiation and gradual uptitration is recommended. The ESC guidance also indicates that mild deterioration in pulmonary function and symptoms should not lead to prompt discontinuation. Cardioselectivity is paramount; metoprolol, bisoprolol and nebivolol are candidates.

Beta-agonists are associated with incident heart failure in patients with pulmonary disease, and with increased mortality and hospitalisation in those with existing heart failure. We must not assume causation from association. Nevertheless, beta₂-agonists exert numerous unfavourable cardiovascular effects: tachycardia, hypokalaemia, QTC prolongation, peripheral vasodilatation, disturbed autonomic modulation and depressed heart rate variability. Clinicians should therefore prescribe beta-agonists only for clear symptom relief, after carefully considering the cause of dyspnoea and objectively documenting airflow obstruction. Oral beta-agonists should be avoided, and both the dose and frequency of nebulised therapy minimised.

Patients with heart failure and concomitant COPD who require regular long-acting inhaled bronchodilators should receive a long-acting antimuscarinic rather than a long-acting beta-agonist. Tiotropium has proven efficacy in both COPD and asthma, with reassuring cardiovascular safety data and US Food and Drug Administration approval. Tiotropium is also more effective at preventing exacerbations, with similar tolerability, than salmeterol in patients with COPD. Finally, whenever bronchodilator use increases in patients with heart failure and concurrent COPD, the possibility of worsening heart failure must always be considered.

References
4. Dickstein K, Cohen-Solal A, Filippatos G et al. ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2008: the Task Force for the Diagnosis and Treatment of Acute and Chronic Heart Failure 2008 of the European Society of Cardiology. Developed in collaboration with the Heart Failure Association of the ESC (HFA) and endorsed by the European Society of Intensive Care Medicine (ESICM). Eur Heart J 2008; 29:2388–42.
A complex physiological interplay exists between the heart and the kidney, with the optimal functioning of either organ system being inter-dependent upon the other. It is now appreciated that many patients with chronic heart failure (CHF) also have chronic kidney disease (CKD). The prevalence of CKD in patients with heart failure will be determined, at least in part, by the definition used (i.e. cut-off in estimated glomerular filtration rate [eGFR]) and patient group studied (acute versus CHF, age, clinical trial, select cohort, etc.). Hillege and colleagues evaluated data from the CHARM study and showed that 36% of subjects were in CKD stage III or worse (eGFR <60 ml/min/1.73 m²), whilst 16% were in CKD stage IIb or worse (eGFR <45 ml/min/1.73 m²). In contrast, data from the US ADHERE registry showed that 64% of patients had at least moderate CKD (<60 ml/min/1.73 m²) at the time of presentation with decompensated heart failure.

Studies have repeatedly shown that impaired renal function is an independent predictor of mortality and adverse cardiovascular outcome, irrespective of the cohort of patients with CHF studied. Furthermore, deterioration in renal function (known as acute kidney injury) is itself a predictor of outcome; this is most commonly seen around the time of decompensation, and even small (26 µmol/l) increases in serum creatinine portend a poor prognosis.

This relationship has come to be known as “cardio-renal syndrome”. Different definitions have been put forward as to what this truly means, and more recently sub-divisions of the cardio-renal syndrome have been touted. The precise pathophysiological mechanisms involved are not, however, clearly established. Haemodynamic abnormalities such as reduced renal arterial perfusion and renal venous congestion are undoubtedly important and may influence treatment strategy. Abnormalities of neurohormonal and immune activation are likely to be involved, as is anaemia and iron deficiency.

Treatment of such patients can be challenging. Many patients with CHF and advanced CKD do not receive renin–angiotensin–aldosterone blockade due to fear of further deterioration in renal function. Yet this group exhibit the highest event rates and as such have much to gain from treatment.

This presentation will give a background to the problem and then focus on challenging clinical scenarios with hopefully pragmatic discussion, albeit often not totally evidence based!

References
ABSTRACTS: SESSION 2

Individual problems: the patient with heart failure and diabetes

Chim Lang
Centre for Cardiovascular and Lung Biology, University of Dundee Medical School

Chronic heart failure (CHF) and diabetes frequently coexist. In population-based studies and in CHF trials, the prevalence of diabetes is estimated to be between 11% and 28%, and among all patients hospitalised for heart failure, it has been reported that 25–30% have diabetes. Although diabetes predisposes to the development of CHF, CHF may also lead to the development of insulin resistance and diabetes. Close to two-thirds of patients with CHF have insulin resistance that is associated with decreased exercise capacity and endothelial dysfunction. Thus, there exists a reciprocal interrelationship between CHF and insulin resistance and diabetes, and this relationship can be lethal since diabetes has consistently been shown to be an independent predictor of increased morbidity and mortality in patients with either symptomatic heart failure or asymptomatic left ventricular dysfunction. It is difficult to outline an evidence-based diabetic treatment strategy in these patients because there have been no randomised trials that have adequately explored the risks and benefits of diabetic therapies in this at-risk population. Observational data may suggest some current treatment options, although larger randomised control trials are clearly needed.

Further reading
Individual problems: the patient with heart failure and great age

John Baxter
Sunderland Royal Hospital

This lecture will focus on three key issues when managing heart failure patients who are of a “great age”.

Dealing with co-morbidities
Elderly patients often have multiple co-morbidities, which may lead to difficulties in managing heart failure symptoms. Lung disease, renal impairment and diabetes are all common and will be covered earlier in this session. Cognitive impairment is common in congestive heart failure (CHF) patients with great age. CHF service deliverers need to be aware of how to identify that their patients have cognitive impairment and alter treatment strategies to aid CHF management. CHF treatment can also affect the other geriatric giants of falls and incontinence. Balancing these with aggressive CHF management can cause difficult therapeutic dilemmas.

Does standard therapy need to be different in elderly CHF patients?
We are all rightly concerned about drug tolerability and side effects. Given recent evidence and National Institute for Health and Clinical Excellence (NICE) guidance updates, standard therapy is becoming more aggressive and complicated. The risks of side effects in the CHF patient with great age need to be carefully considered, but CHF teams must ensure that these patients are given appropriate treatments that will deliver patient-centred treatment goals.

Improving end-of-life care
Huge improvements have been made in access to investigations and effective treatments. CHF service providers need also to focus on improving end-of-life care, especially in patients with CHF and great age. Earlier case identification, better communication with patients and carers, information sharing across the CHF service and wider healthcare environment, and using established palliative care interventions such as advanced care planning will improve patient choice. The CHF team need to lead on facilitating service improvement in this area.
With the increasing accessibility and affordability of air travel and the increasing prevalence of heart failure, more people with heart failure may wish to travel by air. There are a number of potential hazards in the aviation environment that might be of concern to such patients. These include the stress, anxiety and fatigue associated with travelling, the physical exertion of walking through the airport and carrying baggage, and the reduced oxygen level due to the low air pressure in the aeroplane cabin, which may be equivalent to breathing 15% oxygen at sea level.

There may be concern that these factors might cause increased symptoms or precipitate an episode of acute heart failure or arrhythmia. Airline experience is generally favourable, in that in-flight medical incidents are relatively uncommon and cardiac causes account for less than 10% of those that occur. Simulation studies have shown that mild hypoxia, as might be experienced in the aeroplane cabin, is generally well tolerated and unlikely to cause adverse clinical outcomes. A recent questionnaire study examined the reported experience of heart failure patients during air travel. Of 250 respondents who had flown, one-third reported health-related problems going through security, during the flight or, more commonly, at the final destination. Around 20% of patients with heart failure reported difficulty in obtaining travel insurance.

Heart failure is a risk factor for venous thrombosis, and in addition to following the standard advice to keep mobile by walking around the cabin or exercising the legs, and to maintain hydration, the use of graduated compression stockings should also be considered. In the highest-risk patients, with other important risk factors, subcutaneous low molecular weight heparin may also be advisable.

Patients with an implanted pacemaker or an implanted cardioverter defibrillator may fly from 2 days post-implant, provided there is no pneumothorax or rhythm instability. The risk of electromagnetic interference in the aeroplane is remote and security gates should pose no problem. Patients should declare their implant to the security staff and walk briskly through the gate, if asked to do so. Prolonged application or to-and-fro sweeps of hand-held screening devices should be avoided.

In summary, the evidence regarding the safety of air travel for patients with heart failure is reassuring but limited. Recent guidance from the British Cardiovascular Society suggests that there should be no restriction on flying for patients with stable heart failure although those with class III heart failure should consider requesting airport assistance and the availability of in-flight oxygen in advance. Patients with class IV heart failure need careful assessment and individualised advice. All patients should be advised to allow ample time to pass through the airport and request assistance with luggage. They should also be reminded to carry enough medicine in their hand luggage, and to carry a device passport, if appropriate, and a summary of medical and ECG history.

Further reading
Exercise
Andrew Clark
Castle Hill Hospital, Kingston upon Hull

Standard advice to patients with chronic heart failure used to be to avoid exercise, particularly as there was a theoretical concern that exercise might worsen left ventricular function. However, many physiological studies have emphasised the importance of the health of the skeletal muscle in determining exercise capacity, raising the possibility that exercise might be beneficial. From the early 1990s on, there has been a wealth of studies demonstrating that exercise training can improve patients’ symptoms, and can improve some variables associated with an adverse outcome. The HF-Action trial was a large trial of intensive exercise. There was no striking effect on survival, but an early and sustained improvement in quality of life in those patients randomised to exercise training.

The single biggest problem with training as an intervention is persuading patients to do it. Strategies include using electrical muscle stimulation as a way of inducing a training response without the patient having to move from a chair! There is little in the way of company support for exercise – but just imagine what a marketing drive there would be behind a drug that improved exercise capacity by 20%.

Sex
Michael Kirby
University of Hertfordshire, Faculty of Health and Human Sciences, Hatfield

Erectile dysfunction (ED) becomes increasingly common with age, with recent studies demonstrating a prevalence of around 67% in men aged 65 years and over, and 68% in men aged 80 years and over. ED also shares many risk factors with cardiovascular disease (CVD).

The prevalence of ED in patients with New York Heart Association class I–III heart failure has been shown to be 84% in a population of men with an average age of 59 years. Heart failure has detrimental effects both on lifestyle and mood, and ED can be a major contributor to both poor quality of life and depression.

Sexual activity with a usual partner is no more energetic than many daily activities. In young healthy adults, peak coital heart rate is around 140–180 beats per minute, and blood pressure increases by a mean of 80 mmHg for systolic and 50 mmHg for diastolic blood pressure.

In terms of metabolic equivalence of the tasks (METs), sexual activity requires around 2–3 METs in the pre-orgasm stages and 3–4 METS during orgasm. The latter level of exertion is similar to that of walking on level ground at 3–4 mph.

The management of ED in cardiac patients can be complex and compounded by medications used to treat the condition. Management of ED in patients with heart failure should involve:

- Consideration of referral to a specialist
- Optimisation of the patient's clinical status
- Identification of medical co-morbidities, such as type 2 diabetes mellitus, hyperlipidaemia, hypotension or significant atherosclerosis, that are contributing to the ED
- Identification of possible ongoing ischaemia
- Adjustment of medication regimens to avoid negative side effects
- Replacement of propranolol or atenolol with carvedilol
- Avoidance of digoxin and thiazide diuretics
- Replacement of spironolactone with eplerenone
- Replacement of angiotensin-converting enzyme inhibitors with angiotensin-receptor blockers
- First-line use of phosphodiesterase-5 inhibitors (sildenafil preferred), and avoidance of the concurrent use of nitrates.
Other therapies include androgen replacement therapy, intraurethral suppositories, penile prostheses, vacuum erection device (VEDs) and intracavernosal injections. Revascularisation therapy by means of angioplasty of the hypogastric, common iliac or pudendal arteries should also be considered.

Sexual position is another consideration, with men “on top” using the most energy, and adequate foreplay is essential.\(^7\)

The key is remembering to ask questions about sexual concerns and understanding how important sex may be to that patient’s well being and quality of life.

References


Pregnancy

Lorna Swan
Royal Brompton Hospital, London

Pregnancy exerts a considerable cardiovascular stress in the patient with pre-existing ventricular dysfunction. In addition, a new diagnosis of heart failure during pregnancy presents a challenging management issue. Maternal and fetal outcomes need to be balanced carefully when considering investigation, obstetric care and treatment options.

The lecture will discuss two clinical scenarios: pre-conception counselling in the setting of known heart failure and the new diagnosis of heart failure during pregnancy, including peripartum cardiomyopathy. The physiological effects of pregnancy and the issues surrounding choice of delivery will be addressed. The potential detrimental effects of known heart failure drugs in pregnancy and breast-feeding will be discussed.

Oestrogens may be contraindicated in subgroups of patients with heart failure and therefore alternative contraception strategies will be suggested. The particular cardiovascular challenges of assisted conception techniques and IVF will also be addressed.

The recent 2011 European Society of Cardiology guidelines on the management of cardiac disease in pregnancy will be presented.

Further reading

Our understanding of the genetic basis of mendelian cardiac disease has progressed rapidly over the past two decades. Gene identification has begun to shed light on the pathogenesis of a diverse range of cardiac conditions that can all result in cardiac failure. An understanding of the genetic mechanisms and the role of genetics in the cardiology clinic is central to the management of these patients and their families.

This presentation will discuss the genetic causes of primary cardiomyopathy (e.g. HCM, DCM, ARVC, LVNC) and secondary mendelian cardiac disease (e.g. amyloidosis) that predispose to the development of heart failure. Particular attention will be paid to how we use basic clinical genetic techniques to inform proband diagnosis, optimise testing strategies and provide accurate risk assessment (cardiac and genetic) in other family members.

The impact of next generation gene sequencing technology on the availability of genetic tests and the added complexity this might pose to the interpretation of genetic results will be addressed.

We will also discuss how knowledge of the underlying genetic mutation has begun to suggest new and promising treatment options in some disease subgroups.

References and further reading

Who to investigate and how
Gerry Carr-White
St Thomas Hospital, London

Inherited cardiomyopathies are common and the majority remain undetected, either because they do not present to the medical profession or because those involved in their care have not considered the diagnosis. Diagnosing patients accurately allows more focused treatment of their symptoms and assessment of their sudden death risk, and leads to a screening strategy for the wider family. In this presentation we will run through common clinical scenarios.

1) Dilated cardiomyopathy. In those with idiopathic dilated cardiomyopathy 20–35% will be familial and an additional 10–20% may have a treatable, but non-inherited, underlying condition
2) Dilated cardiomyopathy in young patients where metabolic and storage diseases also need to be excluded.
3) Concentric left ventricular hypertrophy focusing on genetic phenocopies of hypertrophic cardiomyopathy and the non-inherited causes.

We will focus on the aetiologies that are often missed, and on specific characteristics that may suggest an underlying diagnoses.
ABSTRACTS: SESSION 4

References and suggestions for further reading


Philip Poole-Wilson Lecture: 10 things Mendel missed

John Burn
Newcastle University

As genetics and genomics become part of routine medical practice, it is interesting and important to reflect on the great discovery of Gregor Mendel and how much more today's clinicians must embrace when managing patients.

Mendel gave us the concept of discrete independent hereditary “factors”, which independently determined the features of the pea plant, some as dominant and some as recessive characters.

Mendel could not have guessed how universal that concept would become and that it applied equally well to humans. Most of the recognised genetic disorders in the Online Mendelian Inheritance in Man catalogue are fitted into the autosomal dominant or recessive categories. The recognition of the sex chromosomes introduced the important category of X-linked diseases, such as Duchenne dystrophy. Rarely, the inactivation of one X in each cell is skewed to the extent that a girl can manifest this disease. The process of methylation involved in X inactivation is now recognised to play a much wider role in determining patterns of gene expression, with many genes only active if transmitted by the mother or the father. Imprinting extends further into the underlying pathology of heart disease and related common disorders, as maternal diet and other exposures can alter the “set” of genes which will have a lifelong impact on the individual and to some extent their offspring. A few important genes in the mitochondria, which come exclusively from the mother, breach Mendel’s rules, as do disorders involving multiple gene loci, the polygenic traits.

The discovery of chromosomes, DNA and the DNA code gave substance to Mendel's experiments but exposed their over-simplicity. Many genes travel together linked on the same chromosome, genes come in fragments or exons which can be spliced together in multiple different functioning forms, a new focus for genetic therapy. Vast numbers of non-coding RNAs modulate the coding genes while copy number variants and repetitive DNA mean that Mendel’s scientific descendents still have much to learn.
Adjusting to living with a chronic condition requires more than the acceptance of certain medicines, devices and surgery. At its core is the development of a relationship between the clinical team and the patient that adapts readily to the patient’s physical and mental circumstances. As the clinical team is addressing the physical aspects, the patient’s psychological state can have a significant bearing on his or her adaptation to living with heart failure. Among the adaptations are:

1. Change
   • Acceptance of the condition and its impact on living

2. Control
   • In the hands of the clinicians
   • Loss of control in life

3. Questions, questions, questions
   • Understanding the condition

4. Psychology
   • Being reminded of being unwell

5. Quality versus quantity
   • A shorter life lived well

6. Sense of self
   • Identity and dignity, when life’s role has changed.

Many stories

In an era of increasingly complex management, patients are expected to take more responsibility for the day-to-day management of their illness and become partners in their care. Whilst clinical knowledge has increased rapidly, knowledge exploring patients’ experiences of living with heart failure is deficient. Limited research suggests that these individuals have to come to terms with their new situation and subsequent “new self”; however, there are a number of obstacles in the way of this process, which may impact severely on both management by professionals and self-management by individuals. To explore this concept, a longitudinal study was conducted to gain insight into individuals’ experiences of becoming a patient with heart failure. A Gadamerian hermeneutic phenomenological methodology underpinned the study. Utilising Gadamer’s notion of authentic conversation, three separate groups of patients – new onset, delayed diagnosis and those living with the condition for sometime – were interviewed on three occasions over a 1-year period (total cohort 21 patients; 9 female). At each subsequent interview, preliminary findings were discussed with the patients.

The study found that patients undergo a process of taking on a new identity, a new self. This process involves the patients first coming to see that they have heart failure, then recognising or fitting this into their “world view” and finally reconstructing themselves in a new way. These phases were neither discrete nor linear; not all patients were able to develop a new understanding of themselves. The phases, similarly, were not milestones that could be achieved and moved on from, but rather were part of a process that was enduring.

The patients’ ability to integrate their new condition with their sense of self was influenced by their ongoing view of their self. Impaired function disrupting daily routines and activities, accompanied by periods of deterioration, setbacks and complications, profoundly affected the ways that the patients constructed their self-concept. This has been found by others investigating the effects of chronic illnesses on individuals. A mismatch between the patients’ expected and experienced reality caused much distress and conflict,
ABSTRACTS: SESSION 6

particularly when this challenged their sense of self-worth. The patients’ success or failure at adapting to their new self was found to influence their self-care behaviours and therefore the effectiveness of treatments. Ongoing assessment of patients’ experiences of the situation that they live with would reveal clues about how they are adapting to their diagnosis and treatment; difficulties could be identified and appropriate care offered. Better understanding the patient’s journey, a process of becoming a heart failure patient, might allow services to be more specifically tailored to individual needs, producing a more clinical and cost-effective delivery of service.

References

Further reading

The great success of medicine

Andrew Clark
Castle Hill Hospital, Kingston upon Hull

The modern management of patients with chronic heart failure is one of the great advances of clinical medicine. The large number of clinical trials available means that almost all our care is based on sound evidence, and we can be confident that the medical therapy we use is improving survival and increasing well-being for our patients. Increasingly, the next important challenge (highlighted in particular by the national audit) is the delivery of care to all the patients with heart failure, not just those fortunate enough to reach a cardiology ward or be referred to a heart failure service.

A very important challenge, though, is that clinical trials and changes to healthcare systems deal with patients in bulk, but it is the individual patients that we meet whom we treat. However much the science of heart failure treatment advances, we need to remember that the person taking the medication may have different hopes and expectations of medicine than we do, and the treatment we offer has to be tailored to meet the needs of that individual.
The need for advanced therapy

Henry Dargie
University of Glasgow

The true need for “advanced therapies” is unknown. It depends on the definition of advanced heart failure, the availability of and indications for advanced therapies and the fiscal determinants of their provision.

If the prevalence of heart failure is between 1% and 2%, then even the most severe 5% of those with heart failure represent a very large number. In a population of about 60 million, as in the UK, some 60 thousand people could fulfil these criteria.

An attempt at a definition of advanced chronic heart failure was published by a working group of the Heart Failure Association of the European Society of Cardiology in 2009 and among its conclusions was a strong statement that more work on its epidemiology was required.

We know from the national audits in the UK that about 60,000 patients are admitted to hospital with worsening heart failure. These patients are the most obvious group who would require “advanced therapies” which, for the purposes of this presentation, could be defined as those who remain in New York Heart Association class III/IV heart failure despite best medical therapy and, where appropriate, cardiac resynchronisation therapy.

Traditionally, advanced therapies have been heart transplantation and ventricular assist devices (VADs) provided in designated centres funded by national commissioning bodies. These units also perform “high risk” conventional cardiac surgery in patients with heart failure, though these are not restricted to transplant/VAD centres. Fewer than 100 adults (about 1.7 patients per million population) had a heart transplant in the UK last year, while the number of VADs, although increasing, also remains low. Clearly, therefore, at least in the UK, these procedures do not even begin to address the needs of patients with advanced heart failure in the UK.

More recently, other therapies have emerged including percutaneous aortic valve replacement and mitral valve repair/replacement for patients who present a high risk for conventional valve procedures. The place of revascularisation in patients with heart failure remains obscure though recent evidence from the STICH trial has been both illuminating and disappointing.

Amidst the “high tech”, the important role of palliative care continues to be increasingly recognised since, in numerical terms, it is the largest need of all.
Assessment for advanced therapy

Simon Williams
Wythenshawe Hospital, Manchester

Patients with advanced heart failure have a poor prognosis and quality of life. Therapies for advanced heart failure (heart transplantation and ventricular assist device implantation) can provide an effective treatment in a select group of patients. Recently, UK guidance for assessing and referring these patients has been published.1 This presentation will cover up-to-date information regarding appropriate selection and referral for transplantation, timing of referral, contraindications and co-morbidity.

Reference

LVADs – the future?

Nick Banner
Royal Brompton & Harefield Hospital NHS Trust, London

Will LVADs play an important role in the future treatment of advanced heart failure? What developments are likely in LVAD support?

LVADs are already playing an important role in the management of advanced heart and are endorsed by the NHS for the “bridge to transplant” indication. The composite findings of the HeartMate I and II trials have demonstrated that there is a survival benefit from the use of a second-generation LVAD compared to conventional medical therapy including the use of inotropes. However, such long-term therapy has not yet been endorsed by the NHS because of concerns about the long-term results and the cost-effectiveness of such treatment. Nevertheless, medium-term results are improving and quality of life has been shown to improve after LVAD support. A UK study is currently underway to compare the quality of life of LVAD recipients to those receiving medical therapy pre-transplant and patients after heart transplantation. In view of the scarcity of hearts available for transplantation, it seems likely that LVAD therapy as an alternative transplantation will become available in the next few years.

Second- and third-generation LVADs are smaller, easier for the surgeon to implant and more reliable than first-generation devices. However, the limitation of support to the left side of the heart makes LVAD therapy less suitable for some patients. Newer approaches to biventricular support are currently under investigation.

With improved device reliability, medium- to long-term survival is now limited by complications not directly related to device function, including infection, haemorrhage, stroke, pump thrombosis and acquired aortic regurgitation, as well as operator error and other patient-related issues. New approaches are needed to address these problems.

Surgical approaches in advanced heart failure

Steven Tsui
Papworth Hospital, Cambridge

There is no abstract for this session.
ABSTRACTS: SESSION 8

The top five clinical trials

John Cleland
University of Hull

Studies relevant to heart failure that are important for clinical practice will be presented.

The STICH (Surgical Treatment for Ischemic Heart Failure) trial failed to show a benefit of revascularisation on all-cause mortality in patients with heart failure and coronary artery disease; however, cardiovascular deaths were reduced compared with medical therapy alone.

Results from the TARGET (Targeted Left Ventricular Lead Placement to Guide Cardiac Resynchronisation Therapy) study demonstrate that targeted left-ventricular lead placement using speckle tracking echocardiography is feasible in patients undergoing implantation of a cardiac resynchronisation therapy device and is associated with an enhanced response.

Two-year follow-up data from EVEREST (Endovascular Valve Edge-to-Edge Repair Study) II show that although a catheter-based mitral valve repair procedure using the MitraClip system was less effective at reducing mitral regurgitation than conventional surgery, similar improvements in clinical outcomes were observed with fewer short-term adverse events.

Sub-analyses of the SHIFT (Ivabradine and outcomes in chronic heart failure) study, comparing ivabradine to placebo on top of beta-blocker, suggested improvements in cardiac function and quality of life in addition to the reduction in morbidity and mortality identified in the main study.

Further trials presented at the American Heart Association in November 2011 may also be discussed.

Is there a future for heart transplantation in the UK?

Guy MacGowan
Freeman Hospital, Newcastle upon Tyne

Heart transplantation in carefully selected patients with end-stage heart failure can offer a tremendous new lease of life, in terms of living longer and quality of life. Heart transplant numbers over the past 10 years and more have gradually fallen, which has led to great difficulty in acquiring organs for those patients who would benefit from transplantation. The reasons for this are multifactorial, and probably not fully understood, but include improvements in road safety, and more recently an increase in organ donation from donors with cardiac death as opposed to brain death. Another issue of great importance is increased sensitivity of human leukocyte antigen (HLA) antibody screening, which has questionable clinical relevance in some situations, but can make donor hearts more difficult to match to suitable recipients. Strenuous efforts are underway to increase organ donation and heart transplant numbers, so hopefully at least the decline will be arrested. Research into using hearts from donors after cardiac death is needed, and also how best to use HLA antibody screening so that we avoid potentially fatal rejection but do not unnecessarily limit heart transplant numbers.

But perhaps the more important question is how do we treat more patients with advanced heart failure in the future? Heart transplantation, even at its height, involved a very small number of patients relative to the total amount of patients with heart failure in the UK. Left ventricular assist devices are increasingly and successfully used in this country and abroad to support patients with advanced heart failure. Indeed, given the difficulty in obtaining transplants, some patients receiving left ventricular assist devices as a
bridge to transplant in this country may never actually receive a transplant. These patients can reasonably be expected to return home and live relatively active lifestyles, much improved compared with before surgery.

One proposal is to sever the link between ventricular assist devices and transplant (i.e. bridge to transplant indication), recognising that in many patients that although transplantation is desirable it may be difficult to obtain, and so long-term support with a ventricular assist device is warranted. In the first instance this means adequate funding for long-term support for ventricular assist devices in patients in whom a transplant is desirable though not feasible. Subsequently, we need funding for destination therapy whereby patients who are not or who are unlikely ever to be transplant candidates are supported with a ventricular assist device. This has recently been recommended in European Society of Cardiology guidelines. In these financially stringent times questions will be raised about costs, but as survival increases, with most patients expected to survive more than 2 years, this will inevitably shift the balance of cost effectiveness in favour of the devices.

So, heart transplantation does have a future, and its future is likely to be something like its past – successfully treating small numbers of highly selected patients. The challenge is to treat more patients with heart failure who would otherwise die, and that means using both transplantation and ventricular assist devices to their maximum potential.

References

Commentary on the future for heart transplantation in the UK

Tom Treasure
University College London

There is no abstract for this session.
BIOGRAPHIES

Dr Nick Banner

Dr Nick Banner is Consultant in Cardiology, Transplant Medicine and Circulatory Support at the Royal Brompton and Harefield NHS Foundation Trust, Harefield Hospital, Middlesex, and Honorary Senior Lecturer at Imperial College, London. His clinical work and research interests are centred on the care of patients with advanced heart failure and of those who have undergone heart transplantation or ventricular assist device implantation. Dr Banner is a Fellow of the Royal College of Physicians of London and also of the European Society of Cardiology. He is a former member of the Board of Governors of the International Society for Heart and Lung Transplantation and is a past Chair of their Education Committee. He is Chairman of the UK Cardiothoracic Transplant Audit Steering Group and a past President of the Cardiology Section of the Royal Society of Medicine. He is a member of the NHS Blood and Transplant Cardiothoracic Transplant Advisory Group (CTAG). He has recently chaired a joint BSH and CTAG working group on guidelines for referral for heart transplantation and ventricular assist device support (published in Heart). He has recently been elected Deputy Chair of the Thoracic Committee of the European Society of Organ Transplantation.

Dr John Baxter

I am a Consultant Geriatrician at Sunderland Royal Hospital, with an interest in heart failure in older persons.

I am clinical lead for heart failure at Sunderland Royal Hospital.

I am a Councillor on the Board of the British Society for Heart Failure. I am a committee member of the British Geriatrics Society Cardiovascular Section. I am a clinical advisor to the National Council for Palliative Care.

Dr Edward Blair

Dr Edward Blair is a consultant clinical geneticist and lead clinician in clinical genetics at the Churchill Hospital in Oxford. He has a long-standing clinical and research interest in inherited cardiovascular disease. Dr Blair has worked in cardiac gene identification programmes in Oxford since 1998, initially as a British Heart Foundation and Wellcome trust Fellow, and latterly as a member of the genomics board of the Oxford Biomedical Research Centre (OBRC).

Working with Professor Hugh Watkins, Dr Blair is active clinically in cardiovascular genetic medicine through the Oxford ICC and Marfan syndrome clinics.

Dr Blair has helped develop and establish routine genetic testing for cardiomyopathy and LQTS in the NHS and he continues to work to develop novel testing strategies such as next generation gene sequencing.

Dr Blair was part of the NHS advisory committee on Chapter 8 of the Cardiac NSF and worked with HRUK to develop clinical cardiac genetic testing guidelines.

Professor Sir John Burn

Sir John was knighted in the 2010 New Year's Honours list for services to Medicine and Healthcare. He was born and raised in North East England and attended Newcastle University Medical School. In 1973, he was awarded a first-class honours degree in Medical Science after an intercalated year in Human Genetics. After qualifying, he completed medical and paediatric rotations before being appointed Clinical Scientific Officer at the MRC Clinical Genetics Unit in London. As honorary senior registrar at the Hospital for Sick Children Great Ormond Street he completed training as a clinical geneticist and became the first specialist in the field in the North East in 1984. From 1989 to 2004, he led a unified clinical and laboratory team, the Northern
Genetics Service, caring for the three million people of the North East and Cumbria. He became the first Professor of Clinical Genetics in 1991.

He was Director of the Institute of Human Genetics (IHG) from 2005 to 2010, during which time the tenured staff rose to 33, 18 of them professors, with an overall staff of approaching 200 and a 3rd place behind Oxford and Cambridge for quality in the 2008 Research Assessment.

He conceived and helped bring to fruition the Millennium Landmark Centre for Life in Newcastle opened by the Queen in 2000. In addition to housing the IHG and the region’s Fertility and Genetics Services, the Centre attracts a quarter of a million paying visitors to its science centre and provides practical science education to 40,000 schoolchildren per annum. From 2000 to 2005, he was a founder member of the Human Genetics Commission. From 2002 to 2007, he was Public Orator for Newcastle University. Extensive media involvement includes being scientific advisor and participant in the BBC/Discovery series How to Build a Human in 2001. In 2008, he was appointed Chair of the newly created Clinical Genetics Specialty Group of the National Institute of Health Research. In 2009, he became Director of the National Collaborative Group on Genetics in Healthcare and Lead Clinician for the NHS in the North East of England. In 2010, he was appointed to Chair the innovation strand of the new UK Human Genomics Steering Group.

Sir John is an author on over 250 peer-reviewed articles; his early research in the 1970s and 80s focused on the causes and prevention of birth defects. His MD thesis on the causes of heart malformation was awarded a distinction. In subsequent years he discovered a new neurodegenerative disorder for which his team found the causative mutation in L chain ferritin, leading to the name neuroferritinopathy. He developed an international consortium to pursue the idea of chemoprevention in those at genetic risk of colorectal cancer. Its second study, CAPP2, resulted in a first-author paper in the New England Journal of Medicine in 2008. Recent follow-up of that international cohort of 1000 carriers of mismatch repair gene defects has revealed a 50% reduction in colorectal and other related cancers in those treated with aspirin.

Mrs Jane Butler

Jane is a Consultant Nurse for Heart Failure and has held this position for the past ten years. She has many years' cardiac nursing experience in both the acute sector and in rehabilitation. Jane has co-developed an accredited training programme at City University, London, for nursing staff: "Caring for Chronic Cardiac Patients in the Community". Jane has been an elected council member of the British Society for Heart Failure and has held the posts of Junior Secretary / Honorary Secretary for the British Association for Nursing in Cardiac Care (BANCC). Jane is a member of the National Council for Palliative Care Heart Failure Policy Group and has contributed to the development of the 2005 and 2010 audits on the engagement of Heart Failure Specialist Nurses with Palliative Care Services. She was the clinical lead in the development of the Heart Failure Service Toolkit for the North East London Cardiac Network. Jane gained her Masters degree in Cardiology at Brighton University and has recently successfully gained her Post Graduate Certificate in academic practice at City University London. She is currently conducting preliminary work for her PhD. As an author of several publications she often peer reviews for the British Journal of Cardiac Nursing.

Dr Gerald Carr-White

Dr Gerald Carr-White is a Consultant Cardiologist at Guys and St Thomas NHS Foundation Trust where he is the clinical lead for heart failure. He is director of inherited cardiac diseases across Kings Health Partners (Guys, St Thomas and Kings College Hospitals). His research interests include the mechanics of ventricular function in heart failure and cardiomyopathies, which was the basis of his PhD at the Royal Brompton Hospital, and MRI and echo predictors of response to CRT in ischaemic and non-ischaemic cardiomyopathies.
Professor Andrew Clark

Professor Andrew Clark was educated at Pembroke College, Cambridge, and trained in medicine at the Westminster Medical School, London. He trained in cardiology at Manchester Royal Infirmary, the National Heart and Lung Institute in London and the Western Infirmary in Glasgow. Whilst at the National Heart and Lung Institute, under the guidance of Philip Poole-Wilson and Andrew Coats, he developed an interest in exercise physiology, particularly in patients with heart failure.

He became a Senior Lecturer in cardiology at the University of Hull in 1999 and was promoted to Reader in 2004. He is responsible for running the echocardiography service in Hull, and plays an active role in the day-to-day provision of cardiology services to the population of Hull and the East Riding of Yorkshire. He became a professor in 2009.

He is a member of the Working Groups for Heart Failure and Cardiac Rehabilitation and Exercise Physiology in the European Society of Cardiology. He is a founder member of the British Society for Heart Failure, and became Chair-Elect in the 2011 elections.

Professor John Cleland

Professor John Cleland qualified in medicine in 1977 at the University of Glasgow. After a period of postgraduate training and an introduction to research he was appointed from 1986–1994 first as a Senior Registrar and subsequently as Senior Lecturer in Cardiology and Honorary Consultant Cardiologist at St Mary’s Hospital, Paddington and the Hammersmith Hospital, London. In 1994, Professor Cleland was awarded a Senior Research Fellowship by the British Heart Foundation to transfer to the Medical Research Council’s Clinical Research Initiative in Heart Failure. Professor Cleland was appointed to the Foundation Chair of Cardiology at the University of Hull in 1999.

Professor Cleland’s main field of interest is in heart failure, extending from its epidemiology, detection and prevention, through the development and implementation of guidelines for the application of current knowledge, to large randomised trials to study new (and old) treatments for heart failure. Particular current interests include the role of myocardial hibernation contributing to heart failure and its treatment (including beta-blockers and revascularisation), “diastolic” heart failure, vascular dysfunction, the potential deleterious effect of aspirin in heart failure, ventricular resynchronisation, telemonitoring, implantable haemodynamic monitoring devices, co-morbidities including diabetes, anaemia, atrial fibrillation and renal dysfunction, and new interventions for acute decompensated heart failure. Active programmes for the assessment of heart failure and its optimal management using cardiac impedance, magnetic resonance, computed tomography and advanced electrophysiology are also in place.

Professor Cleland heads The Academic Unit of Cardiology that includes a Reader, two Senior Lecturers and a team of basic and clinical scientists, technicians and research nurses dedicated to the above research programme.

Professor Martin R Cowie

Professor Martin Cowie is Professor of Cardiology at the National Heart & Lung Institute, Imperial College, and Honorary Consultant Cardiologist at the Royal Brompton Hospital, London.

A founding member and past-chair of the British Society for Heart Failure, Professor Cowie has also been a Board member (and Chair of the Education Committee) of the Heart Failure Association of the European Society of Cardiology (ESC). He advises NICE on heart failure issues, and is a Senior Investigator of the National Institute of Health Research. In 2010, he was asked to set up and chair the National Heart Failure Study Group, working to facilitate robust multicentre studies addressing clinically relevant issues in the UK.
Professor Cowie’s studies and reviews have been featured in a variety of peer-reviewed journals, including *The Lancet*, *European Heart Journal*, *British Medical Journal*, *Heart* and the *European Journal of Heart Failure*. He is a member of the editorial board of *Heart*, *The British Journal of Diabetes & Vascular Diseases*, *Cardiovascular Diabetology* and the *European Journal of Heart Failure*. He has contributed chapters to many books, including a chapter on heart failure for the 2010 version of the *Oxford Textbook of Medicine*.

**Professor Henry Dargie**

Most recently the Director of the Scottish Advanced Heart Failure Service at the Golden Jubilee National Hospital in Clydebank, Henry Dargie is now an Honorary Consultant Cardiologist at the Western Infirmary in Glasgow where he has spent most of his career since his consultant appointment in 1980.

A graduate of Glasgow University, he trained in general medicine and nephrology at Glasgow Royal Infirmary and in clinical pharmacology and cardiology at the Royal Postgraduate Medical School and Hammersmith Hospital in London.

He has had a longstanding interest in several aspects of heart failure, including epidemiology, investigation and treatment, and was the Principal Investigator for several large clinical trials including the CIBIS II and CAPRICORN trials of bisoprolol and carvedilol in heart failure.

Other previous appointments include membership of the Commission of Human Medicines and Chairman of the External Advisory Group on Medicines for Cardiovascular and Renal disease and Diabetes of the Medicines and Healthcare Products Regulatory Agency of the UK and Chairman of the Specialist Advisory Group on Cardiovascular Medicines for the Committee on Human Medicinal Products of the European Medicines Agency.

His most recent major interest has been in the national audits of heart failure in the UK, and in the raising of the standard of management of heart failure to that afforded patients with other major cardiovascular conditions such as heart attacks where specialist treatments have greatly improved outcomes.

**Dr Ahmet Fuat**

Dr Ahmet Fuat has been in general practice in Darlington since 1986. Previously a GP tutor and PCT cardiology lead, he now acts as GP advisor to County Durham and Darlington NHS Foundation Trust. He works as a GP specialist in cardiology and, for 9 years, has run an integrated heart failure service across primary and secondary care. Holding a PhD from Durham University, he is an active researcher in cardiology and an honorary senior clinical lecturer at the School of Medicine and Health at Durham.

Dr Fuat sits on the editorial boards of both the *British Journal of Cardiology* and *Primary Care Cardiovascular Journal*. He is a tutor on the Bradford postgraduate diploma in cardiology course, and chairs and lectures on the highly successful BMJ Masterclasses in Cardiology series. Dr Fuat has been instrumental (with Dr Kathryn Griffith) in setting up a GPSI Forum in Cardiology, which is currently affiliated to the Primary Care Cardiovascular Society. This Forum now boasts 100 members, who support each other and meet regularly in clinical symposia. He was involved as an expert adviser for the recent National Institute for Health and Clinical Excellence heart failure guidelines and is on the heart failure steering committee for the British Heart Foundation.
BIOGRAPHIES

Dr Suzanna Hardman

Dr Suzanna Hardman is a Consultant Cardiologist with an Interest in Community Cardiology at the Whittington Health, London, an ICO, where she leads the Heart Failure Services and related research, and is an Honorary Senior Lecturer at University College London. She has worked closely with the community for many years to ensure consistent high-quality care for patients with heart failure, irrespective of where they present.

A lack of evidence to determine clinical practice has been the stimulus for her heart failure research, which has included the role of natriuretic peptides in diagnosis, and different models of care for heart failure patients – demonstrating the impact of early diagnosis, optimal inpatient care and self management for some, in effecting lower mortality and re-admission rates. The impact of interval on left ventricular function, using atrial fibrillation as a model, was the subject of her PhD and remains an area of interest.

She is very involved with the emerging Advanced Training in Heart Failure and advises the pan London Specialist Training Committee (cardiology) and Royal Society of Medicine Cardiology section on heart failure-related issues; she also continues to work with the British Society for Heart Failure (BSH) and British Cardiovascular Society on a wide range of issues including re-validation and work-force planning. She was a member of the NICE Guideline Development Group for the partial update of Chronic Heart Failure Guideline (2010) and the group who worked on developing the related Quality Standards (2011).

Dr Hardman has represented the BSH in various contexts in the UK and Europe. A longstanding member of the BSH, she has been elected Councillor, Deputy Chair and Treasurer. She is currently Chair of the Society.

Dr Nat Hawkins

Dr Hawkins is a cardiology registrar specialising in heart failure and device therapy at Liverpool Heart and Chest Hospital. He studied heart failure under the mentorship of John McMurray in Glasgow, and more recently public health with Simon Capewell. Research interests include heart failure and co-morbidities, complex devices and dyssynchrony, inequalities in cardiovascular disease and service development.

Dr Paul Kalra

Dr Paul Kalra is a Consultant Cardiologist at Portsmouth Hospitals NHS Trust. He has a sub-specialty interest in heart failure, which includes the implantation of ICD and CRT devices. He is current Treasurer of the British Society for Heart Failure (BSH). He is interested in medical education and research and has in excess of 70 peer-reviewed publications. He is UK Chief Investigator for a worldwide epidemiological study in patients with coronary artery disease (CLARIFY), which has recruited almost 35,000 subjects (nearly 2500 in the UK). He also has a clinical and academic interest in patients with cardio-renal disease. He was co-organiser of the UKs first national Cardio-Renal Conference in 2006; this has now developed into a very successful annual meeting (now in its 6th year) with around 150 delegates. He co-edited ‘Specialist Training in Cardiology’.

His previous role within the BSH was as Councillor (2009–11) during which time he was programme director for the National Trainees meeting for Heart Failure 2010 and (co) 2011, and co-programme director for the Annual Scientific Sessions in November 2010. He has ongoing responsibilities for the British Cardiovascular Society (member of the Knowledge Based Assessment Board & Standard Setting Group) and the European Society of Cardiology (member of the MCQ question setting and review group).
**Professor Michael Kirby**

Professor Michael Kirby worked as a general practitioner in Letchworth, Hertfordshire 1973–2007. He was Director of HertNet (The Hertfordshire Primary Care Research Network) 1998–2007. The practice provided an open access echocardiography service for patients with heart failure for the North Hertfordshire Primary Care Trust. Now he is Visiting Professor to the Faculty of Health and Human Sciences, consultant to the Clinical Trials Coordinating Centre (CTCC) at the University of Hertfordshire. His clinical work is now at the Prostate Centre in London.

He qualified at St Mary’s Hospital, London, before working as a Cardiology Registrar at the QEII Hospital, Welwyn Garden City, Hertfordshire. He is an Associate Member of the British Association of Urological Surgeons and a Fellow of the Royal College of Physicians. His special interests include cardiology, diabetes, osteoporosis, men’s health, urology and education. He is editor of the *Primary Care Cardiovascular Journal* (PCCJ), on the editorial board of the *British Journal of Primary Care Nursing*, the *British Journal of Cardiology*, *Geriatric Medicine* and the *International Journal of Clinical Practice*. He also holds membership of several NHS advisory boards. He has published more than 350 clinical papers and 30 books.

**Professor Chim Lang**

Professor Lang is a consultant cardiologist and clinical pharmacologist and Professor of Cardiology at University of Dundee. He trained in both cardiology and clinical pharmacology in the UK and in the USA, where he was a Merck Fellow at Vanderbilt University, Nashville, and a Fulbright Scholar at Columbia University, New York. His patient-oriented research takes a multidisciplinary approach to the understanding of the pathophysiology of heart failure and cardiometabolic diseases. He leads an integrated cardiovascular research laboratory dedicated to, and equipped for, the study of cardiac and vasomotor regulation. These techniques are applied to translational research and in the development of biomarkers and novel treatment strategies in patients with cardiovascular diseases. He sits on the editorial boards of several scientific journals including *Cardiovascular Therapeutics* (Joint Editor-in-Chief), *Heart* (Associate Editor), *Clinical Science* (Associate Editor) and *Current Clinical Pharmacology*.

**Mrs Katie Longton**

Katie Longton studied at King’s College, London, and, when qualified in 2003, undertook a cardiac rotation at Guy’s and St Thomas’ NHS Foundation Trust. Four years ago she became a British Heart Foundation Heart Failure Clinical Nurse Specialist for Tower Hamlets PCT after gaining her specialist heart failure qualification through Glasgow Caledonian University. During this time she became passionate about the palliative care of people living with advanced heart failure and worked directly with St Joseph’s Hospice, Hackney, developing an end-of-life pathway of care. This collaborative project, entitled “Diversity in heart failure and its management at end of life” won the Involvement to Impact Award in 2008 from the NHS Centre for Involvement.

This work led to full-time employment in a new and innovative role as a Heart Failure Clinical Nurse Specialist within the palliative care setting at St Joseph’s Hospice. Katie was awarded a substantial grant from Help the Hospice to expand her work around heart failure and palliative care. The grant project, entitled “Widening access through nurse leadership”, aimed to address some of the barriers to end-of-life care for people with heart failure. She recently set up a Heart Failure Well-being Clinic at St Joseph’s Hospice, to improve the understanding of hospices within the heart failure community, for both patients and professionals. This concept recently won the International Journal of Palliative Nursing Award 2011 in the non-cancer category.

Katie has presented her work at the 2011 Help the Hospices National Conference in Bournemouth and is writing up the findings of her work for publication.
Mrs Annie MacCallum

Annie is Head of Heart Services at NHS Gloucestershire. She gained her cardiology experience in cardiac units in Edinburgh, Bristol and Gloucester, and has 10 years of coronary heart disease practice nurse experience in primary care. The experience gained in the acute hospital management of heart failure and her primary care experiences helped to inform her understanding of the unmet needs of heart failure patients.

Annie developed the proposal for a countywide Heart Failure Service in Gloucestershire. Launched in January 2004 and with the help of a successful bid to the British Heart Foundation, the Service offers community echo, GPSI clinics and eight Heart Failure Specialist Nurses based in primary care, but in close liaison with acute hospitals and cardiologists. Annie joined the heart failure policy group for the National Council for Palliative Care in 2009 and contributed to the development of the 2010 audit on the engagement of Heart Failure Specialist Nurses with Palliative Care Services.

A contributor to the British Journal of Cardiac Nursing, she has published articles on symptom management in end-stage heart failure this year.

Annie is an Observer to the Board of the British Society for Heart Failure.

Dr Guy MacGowan

Dr MacGowan graduated from the Royal College of Surgeons in Ireland in 1986 and, after initial training in Dublin, undertook research in cardiac magnetic resonance imaging and cardiomyopathy at Johns Hopkins in Baltimore, USA. Subsequently, he undertook a 4-year cardiac fellowship, including a year of specialist training in heart failure and transplantation at the University of Pittsburgh Medical Center, Pennsylvania. After completing training, he was an Assistant Professor of Medicine at Pittsburgh in the heart failure and transplant service from 1997 to 2004, before leaving to take up his current position as Consultant Cardiologist with a major interest in heart failure at the Freeman Hospital in Newcastle.

Mrs Jayne Masters

Jayne Masters is the Nursing Lead for the Heart Failure Service at University Hospital Southampton NHS Trust.

Jayne qualified from the University Hospital of Wales in 1986 and went on to gain nursing experience in several areas before specialising in heart failure.

Jayne was appointed as a British Heart Foundation (BHF) community heart failure nurse in the New Forest in 2005, and went on to develop a successful service that was eventually fully funded by Hampshire PCT. In 2008, Jayne was appointed to lead a new inpatient heart failure service at Southampton General Hospital. The service, which sees heart failure patients in all areas of the hospital, has been instrumental in reducing inpatient mortality for heart failure and also readmissions. Patients are seen quickly post-discharge in the heart failure clinic, which runs daily during the week and have access to a telephone helpline. The team work closely with their colleagues in primary care and together provide an integrated service for this group of patients. Providing a seamless service between primary and secondary care has been an important objective for Jayne over the past 3 years. She has continued to work closely with the BHF in her new role.

Jayne is also very involved with the treatment of patients undergoing ultrafiltration, which has recently started at the hospital, providing education and support to nursing staff, patients and relatives. She is also just completing an MSc in Cardiology at Brighton University.
Professor Theresa McDonagh

Theresa McDonagh is a Consultant Cardiologist with an interest in heart failure at King’s College Hospital, London. Clinically, she has a long track record in heart failure. In addition to having a hands-on input in clinical heart failure, she has research interests in the epidemiology of left ventricular dysfunction and in the clinical utility of biomarkers in both the diagnosis and prognosis of heart failure.

She has been on the Board of the British Society for Heart Failure (BSH) for the past 10 years in various capacities, and is now Past-Chair of the Society. She has taken a particular interest in developing clinical standards for heart failure and, through the Specialty Advisory Committee in Cardiology, has been involved with developing the heart failure curriculum for sub-specialty cardiology registrar training. In addition, she is the Clinical Lead for the National Heart Failure Audit.

Mr Richard Mindham

Richard Mindham has spent his adult life in commercial roles, most recently as Sales Director, primarily in overseas positions.

Richard was diagnosed with dilated cardiomyopathy in 2008, and subsequently served as a patient representative on the National Institute for Health and Clinical Excellence (NICE) Guideline Development Group for Chronic Heart Failure. In 2010, Richard sat on the NICE Quality Standards Committee for Chronic Heart Failure.

Richard runs the West London support group for the Cardiomyopathy Association and he is a patient representative on the Royal Brompton and Harefield Cardiovascular Biomedical Research Unit.

Dr Jim Moore

I studied medicine as an undergraduate in Edinburgh before moving to Gloucestershire to work as a GP principal. Throughout my medical career I have maintained an interest in cardiology and cardiovascular disease, particularly those aspects that are relevant to primary care. I was closely involved in the development of the primary care-based Gloucestershire Heart Failure service, where I continue to work as a GPwSI. I represent primary care in the cardiovascular arena, both at local and regional level, and chair the Gloucestershire CHD network. I am presently a Councillor on the Board of the British Society for Heart Failure.

Dr Nigel Rowell

I have been a GP and clinical assistant in cardiology for 24 years and involved with commissioning for 16 years. Six years ago I was invited to join the Board of the British Society for Heart Failure as an observer and have since been back as a council member and am currently an Observer once more. From my connection with the society, invitations flowed to give talks mainly around heart failure in primary care and I became involved with GPSI forum in cardiology. Last year I applied for the job of national clinical adviser in heart failure in primary care to NHS Improvement and was delighted to be offered the post. Though many of the NHS Improvement projects were underway it seems I joined the team at just the right time to help with the changing political view on commissioning.
Professor Iain Squire

Professor Iain Squire qualified from Glasgow University in 1987. He trained first at Glasgow, where he held the position of Lecturer, and then at the University of Leicester, where he was initially Lecturer then Senior Lecturer in Medicine & Therapeutics. He was awarded a personal Chair in April 2009, and is also Honorary Consultant Physician at the University Hospitals of Leicester NHS Trust.

Professor Squire has responsibility for the 19-bed coronary care unit at Glenfield Hospital, Leicester, and is one of two consultants running the outpatient heart failure service there. He also has responsibility for the Leicestershire Heart Failure Service. He is Vice Chair of the National Institute for Health and Clinical Excellence Technology Appraisals Committee A.

Professor Squire has held the positions of Councillor and Treasurer on the Board of the British Society for Heart Failure, and is currently Deputy Chair. He is UK coordinator for the joint European Society of Cardiology/European Heart Rhythm Association CRT Registry, a position he has held since 2007.

His research interests include: natriuretic peptides and other cardiac neuropeptides; the epidemiology of heart failure; prognostic markers in heart failure and acute coronary syndromes; and acute coronary syndromes. Professor Squire has authored over 120 papers in peer-reviewed journals.

Dr Lorna Swan

Dr Lorna Swan is the Clinical Lead for Adult Congenital Heart Disease (ACHD) at the Royal Brompton & Harefield NHS Foundation Trust, London. She is a Consultant Cardiologist in ACHD, with a remit including pregnancy and heart disease, and ACHD heart failure. Lorna graduated from the University of Glasgow in 1992 and subsequently completed her MD thesis there. In 2001, Lorna undertook a 2-year Clinical Fellowship as the Joint Brompton/Toronto Adult Congenital Cardiology Fellow. Following a locum consultant appointment in Scotland, Lorna took up her current post in 2005.

Dr Lindsey Tilling

I am a year 5 specialist registrar and have previously worked in general cardiology in Oxford and north-eas London. I recently completed my PhD in endothelial repair, specifically focusing on the tissue-protective properties of erythropoietin. I am now on a 2-year fellowship in heart failure, and am currently working at Harefield Hospital, London, on the Transplant Unit. My interests include device implantation and the treatment of advanced heart failure.
**Dr William D Toff**

Dr William Toff qualified in medicine in 1981 at University College Hospital, London, and subsequently trained in General Medicine and Cardiology in London and Leicester. He is currently Senior Lecturer in Clinical Cardiology at the University of Leicester and University Hospitals of Leicester NHS Trust. His main clinical and research interests are in the diagnosis and management of cardiac arrhythmia. He has a particular interest in the design and conduct of clinical trials to evaluate new technologies and he is the Founding Director of the University of Leicester Clinical Trials Unit. Dr Toff has led or contributed to landmark trials of pacemaker mode selection, cardiac resynchronisation therapy, and the use of implanted and external defibrillators. He is a member of national and international standards committees for implanted cardiac devices; has served as a clinical expert advisor for NICE and contributed to numerous health technology appraisals and systematic reviews.

Dr Toff has a long-standing interest in aviation medicine and cardiovascular health issues related to air travel. He conducted research in the Medical Department of the Civil Aviation Authority for three years (1985–87) and contributed to their Medical Advisory Panel for many years. His MD thesis was on the subject of pacemaker function in the aviation environment. He is a member of the UK Expert Advisory Groups for the EU-funded Ideal Cabin Environment (ICE) Project and the European Aviation Safety Agency (EASA)-funded study on the identification and prioritisation of health issues on board aircraft. He is also a member of the Scientific Executive Committee of the WRIGHT Project, an initiative set up in 2001 under the auspices of the World Health Organization to investigate the link between air travel and venous thrombosis. In 2007, he gave expert evidence to the House of Lords Science and Technology Committee Inquiry into Air Travel and Health. He is a member of British Cardiovascular Society Working Group on Cardiac Fitness to Fly, which published its recommendations in 2010.

**Professor Tom Treasure**

Tom Treasure was a student at Guy's Hospital, London, and started surgical life there in the cardiothoracic unit in 1970. He trained in London and the USA, and held consultant positions at The Middlesex, UCH and St George's Hospitals, returning to Guy's in 2001. He has sat on the Council of the Royal College of Surgeons, is a past-President of the European Association for Cardio-thoracic Surgery, and was a recent Chair of the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) and of the Wellcome's Humanities Strategy Committee. He is now based in the Clinical Operational Research Unit in UCL's Department of Mathematics engaged fully in research.

**Mr Steven Tsui**

Steven Tsui is a Consultant Cardiothoracic Surgeon at Papworth Hospital, Cambridge, where he is the Director of the Transplant & Mechanical Circulatory Support programme. His clinical interests focus on surgical device therapies for end-stage heart and lung failure, including extracorporeal membrane oxygenation (ECMO), ventricular assist device (VAD) and total artificial heart (TAH). Other aspects of his clinical practice include pulmonary endarterectomy (PTE) for chronic thromboembolic pulmonary hypertension, and transcatheter aortic valve interventions (TAVI). His research interests include donor optimisation, ex-vivo donor organ perfusion and VADs. He is also the East of England Deanery Training Programme Director in Cardiothoracic Surgery and Deputy Medical Director of Papworth Hospital.
Miss Jenny Welstand

Jenny Welstand trained as a nurse at Charing Cross Hospital in London, qualifying in 1986. She has a broad experience in both surgical and medical cardiac care; in 1990 she joined the cardiac unit in Oxford developing three services: surgical pre-assessment, a cardiology nurse practitioner service and a community cardiac rehabilitation service. Both of the latter services included research elements and resulted in several joint publications.

Jenny joined North East Wales NHS Trust in 2002 to establish a multidisciplinary interface heart failure service spanning both inpatient and community care. The service has led to a substantial reduction in readmission rates and length of stay. Part of the joint working has resulted in a competencies training programme for community nurses undertaking case management roles. To develop her research skills Jenny embarked on a part-time doctorate, investigating patients’ experiences of living with heart failure; now in the final stages, she is on-track to submit her thesis in 2012. Presenting her findings for the first time in 2010 at the Cardiovascular Nurses Spring Meeting in Geneva, she was thrilled when she won best oral presentation at conference. She has subsequently been invited twice to Demark to deliver key note papers. Lived experience is an important research topic, as gaining insight into what it means for patients to have heart failure, and what matters to them, should influence service development. Locally, her research has led to the evolving role of a patient representative service, which now supports bi-annual drop-in coffee afternoons for patients who have a heart failure diagnosis to meet and share experiences.

In 2011, the Welsh Cardiac Network commissioned a Peer Learning Programme to share skills between specialist palliative care and specialist heart failure services. Jenny is part of the development team for this initiative and is leading a pilot in North East Wales.

Jenny has served as a council member on the British Council of Cardiovascular Nursing.

Dr Simon Williams

Dr Williams is the clinical lead for heart failure at the Wythenshawe Hospital. He specialises in cardiac transplant and ventricular assist device assessment, and also in pacing therapy for heart failure. Dr Williams is also an honorary senior lecturer at the University of Manchester, where his research group is currently studying the immune system in heart failure and following cardiac transplantation.

He is currently a Councillor on the British Society for Heart Failure Board 2011–13.
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As the nation’s heart charity, our mission is to play a leading role in the fight against disease of the heart and circulation, so that it is no longer a major cause of disability and premature death.

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- Providing vital information to help people reduce their own risk of dying prematurely from a heart or circulatory related illness. We produce publications, DVDs and other materials for health professionals and the public including children. We inform people about how to improve the health of their heart through public information campaigns, advertising and the media.

Some vital facts and figures
- There are over 700 BHF Healthcare Practitioners caring for patients across the UK.
- Over 3,000 Heartstart UK schemes teach people what to do in an emergency. More than 2.9 million people have been trained by Heartstart UK in schools and the community.
- Last year BHF invested over £100 million in research to keep the nation’s hearts healthy.

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The BSH is a multi-disciplinary society and membership is open to all healthcare professionals involved with the diagnosis, management or science of heart failure.

The aims of the BSH are as follows:

- to increase knowledge and promote research about the diagnosis, causes, management and consequences of heart failure amongst healthcare professionals, with the intention of delaying or preventing the onset of heart failure and improving care for patients with heart failure
- to provide expert advice to healthcare professionals, patient or government organisations, including the National Health Service, when appropriate and as requested.

At present the BSH has 750 members and eleven Friends. The BSH Board consists of the following members: Dr Suzanna Hardman (Chair), Professor Theresa McDonagh (Past Chair), Professor Iain Squire (Deputy Chair), Professor Andrew Clark (Chair-Elect), Dr Paul Kalra (Treasurer), Dr John Baxter, Dr Jim Moore and Dr Simon Williams.

The Observers to the Board are as follows: Dr Alison Duncan, Dr Roy Gardner, Dr Dominic Kelly, Mrs Annie MacCallum, Mrs Jayne Masters and Dr Nigel Rowell.

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NATIONAL INSTITUTE FOR CARDIOVASCULAR OUTCOMES RESEARCH (NICOR)
National Heart failure audit
The National Heart Failure Audit is managed by National Institute for Cardiovascular Outcomes Research within the Institute of Cardiovascular Science at University College London. It has been developed in partnership with the British Society for Heart Failure and is funded by the Healthcare Quality Improvement Partnership.

The purpose of the audit is to measure the quality of care and outcome of patients with an unscheduled admission to hospital with heart failure enabling comparisons between Trusts/Health Boards.

The audit measures performance against national guidelines and standards for heart failure. The dataset consists of 36 core data items and is currently being updated in line with new NICE national guidance and quality standards.

85% of NHS Trusts and Welsh Health Boards are participating in the audit representing approximately 54% of all patients discharged with a primary discharge diagnosis of heart failure.

The key finding from last year’s annual report, that patients admitted to cardiology wards have a 20% lower mortality rate than those admitted to general medicine, underlines the need to develop specialist in-patient services for heart failure patients.

An Academic Group has been established to develop research use of the data and allow external research groups access to the data.

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This includes using a variety of approaches to improve heart failure care. The work covers aspects such as improving screening and access to heart failure services right through to end of life care.

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¹ABPI website – www.abpi.org.uk.

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VIFOR PHARMA UK LTD

Vifor Pharma is a world leading company in the provision of Intravenous Iron for the treatment of Iron Deficiency Anaemia.¹ Ferinject® (ferric carboxymaltose) is the latest intravenous iron preparation that Vifor has brought to the UK and to physicians across Europe.

Iron Deficiency Anaemia is identified in up to 79% of patients suffering from NYHA IV heart failure² and there is an increasing focus on proactive management. The key to effective management of IDA is the use of clinically proven products and efficient infusion programmes. Vifor are keen to work with cardiologists to improve the management of patients with anaemia through improving treatment pathways and services.

For further information on Ferinject please consult the full Summary of Product Characteristics and visit us at our stand where we will be happy to assist you. We look forward to meeting you.

www.viforpharma.com 0304B/FER/2011

References

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In post-MI heart failure protection comes as standard

After MI, heart failure can develop causing symptoms such as shortness of breath and fatigue. In order to prevent these symptoms, treatment with an appropriate medication is necessary. Inspra® (eplerenone) is a potent and selective aldosterone blocker, approved by the FDA as an add-on therapy to ACE inhibitors, beta-blockers, or ARBs in patients with left ventricular dysfunction following an MI. It is designed to help reduce symptoms of heart failure and improve quality of life by blocking aldosterone, a hormone that leads to sodium and water retention in the body. Inspra® has been shown to reduce the risk of hospitalization due to heart failure and improve outcomes in patients with heart failure.

Advantages:
- Helps reduce symptoms of heart failure
- Improves quality of life
- Increases survival rates

Precautions:
- Individuals with hypokalemia or hyperkalemia should be monitored closely.
- Avoid use in patients with severe renal insufficiency (creatinine clearance < 30 mL/min).
- Use with caution in patients with history of hyperkalaemia.

The above information should be reviewed with a healthcare provider for the most accurate and up-to-date guidance.