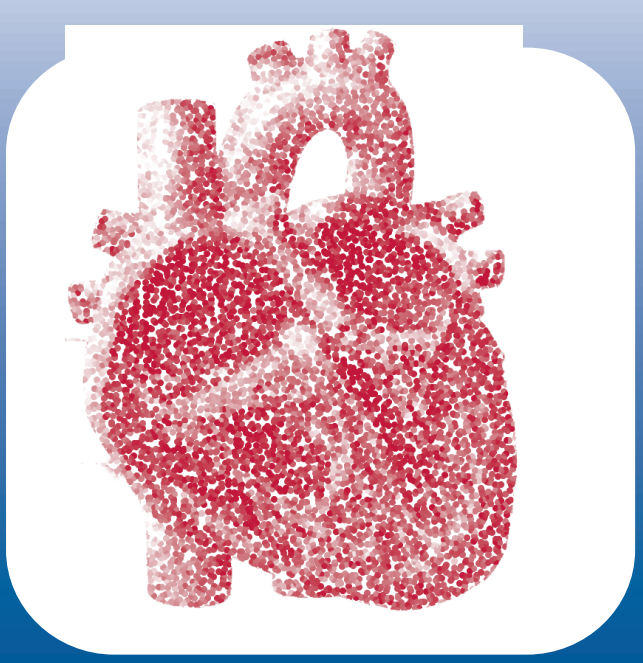

British Society for Heart Failure

12th Annual Autumn Meeting

26–27 November 2009

Heart failure – step-by-step guide to care of a complex syndrome

BSH Annual General Meeting (AGM)

Programme and abstract book

Queen Elizabeth II
Conference Centre
Westminster, London

www.bsh.org.uk

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Contents

This conference is accredited by the Royal College of Nursing Accreditation Unit. It has been awarded 12 study hours and the event reference is 4485. Accreditation applies only to the educational content of the event and does not apply to any product.

This conference has been awarded 12 credits for CPD and the event code is 50129.

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

Advance notice

The BSH 13th Annual Autumn Meeting
will be held at the
Queen Elizabeth II Conference Centre,
Westminster, London,
on 25–26 November 2010

Programme

Programme – Day One THURSDAY 26 NOVEMBER 2009

Autumn Meeting Programme Directors: *Suzanna Hardman / Theresa McDonagh*

09:00	*Registration – Tea/Coffee*
09:30–10:50	**Session 1** **Setting the scene** **Heart failure care in the UK today, Part 1**
Chairs:	***Suzanna Hardman (London) / Nigel Rowell (Middlesbrough)***
09:30–09:50	What is primary care delivering? What is and isn't happening? *Ahmet Fuat (Darlington)*
09:50–10:10	The national picture for the hospitalised patient Data from the National Heart Failure Audit *Henry Dargie (Glasgow) / Theresa McDonagh (London)*
10:10–10:30	Advanced heart failure care – what is being provided and how? CRT/D/CTX and VADs *Simon Williams (Manchester)*
10:30–10:50	Bridging all levels of care – heart failure specialist nurses What are we providing in the UK in 2009 and who is providing it? *Annie MacCallum (Gloucestershire)*
10:50–11:20	*Coffee*
11:20–12:25	**Session 2** **Heart failure care in the UK today, Part 2**
Chairs:	***Suzanna Hardman (London) / Theresa McDonagh (London)***
	The Inaugural Philip Poole-Wilson Memorial Lecture
11:20–11:30	Introduction by: *Martin R Cowie (London)*
11:30–12:20	Time for a change in heart failure care – towards MI status *Henry Dargie (Glasgow)*
12:20–12:25	Thanked by: *Suzanna Hardman (London)*
12:25–13:45	*Lunch and Meet the Experts Sessions*

13:45–15:15	**Session 3** **Improving heart failure care**
Chairs:	***Andrew Clark (Hull) / Asghar Khaghani (London)***
13:45–14:00	Update on pharmacotherapy *John McMurray (Glasgow)*
14:00–14:15	Advances in diagnosis with biomarkers *Theresa McDonagh (London)*
14:15–14:30	What's new for electrical therapy? *Rakesh Sharma (London)*
14:30–14:45	Update on LVADs *Nick Banner (London)*
14:45–15:00	Any news on surgical treatment? *John Cleland (Hull)*
15:00–15:15	Percutaneous valves – an emerging role in heart failure? *Michael Mullen (London)*
15:15–15:45	*Coffee*
15:45–17:15	**Session 4** **A complex syndrome – managing unusual heart failure**
Chairs:	***Henry Dargie (Glasgow) / Paul Kalra (Portsmouth)***
15:45–16:03	Familial DCM *William McKenna (London)*
16:03–16:21	Cardiotoxicity with anthracyclines and trastuzumab *Martin Denvir (Edinburgh)*
16:21–16:39	Restrictive cardiomyopathies *John Sanderson (Birmingham)*
16:39–16:57	Pericardial disease *Alison Duncan (London)*
16:57–17:15	Myocarditis *Simon Williams (Manchester)*
17:15–17:25	*Comfort break/session overflow time*
17:25–18:45	**Session 5** **A complex syndrome – difficult heart failure**
Chairs:	***Peter Cowburn (Southampton) /*** ***Annie MacCallum (Gloucestershire)***
17:25–17:45	Diuretic resistance *Martin R Cowie (London)*
17:45–18:05	Hyponatraemia *Andrew Clark (Hull)*
18:05–18:25	Pulmonary hypertension *John Wort (London)*
18:25–18:45	Heart failure in ACHD *Lorna Swan (London)*
18:45	*Wine and cheese reception*

Programme – Day Two FRIDAY 27 NOVEMBER 2009

09:00–09:25	**BSH Annual General Meeting (BSH members only)**
Chairs:	***Theresa McDonagh (London) / Iain Squire (Leicester)***
09:30–10:50	**Session 6**
	To add to the complexity – managing comorbidities
Chairs:	***Adrian Davies (Middlesbrough) / Jackie Taylor (Glasgow)***
09:30–09:50	The patient with heart failure and sleep disordered breathing *Anita Simonds (London)*
09:50–10:10	The patient with heart failure and arthritis *Niki Walker (London)*
10:10–10:30	The patient with heart failure and atrial fibrillation *Suzanna Hardman (London)*
10:30–10:50	The patient with heart failure and diabetes *Mark Kearney (Leeds)*
10:50–11:20	*Coffee*
11:20–13:00	**Session 7**
	Keeping an eye on all of this – the role of review and monitoring
Chairs:	***Jacky Austin (Abergavenny) / John Cleland (Hull)***
11:20–11:40	Role of outpatient review *Andrew Clark (Hull)*
11:40–12:00	Monitoring with biomarkers *Ahmet Fuat (Darlington)*
12:00–12:20	Telemonitoring *Jill Riley (London)*
12:20–12:40	Monitoring with implanted devices *Rakesh Sharma (London)*
12:40–13:00	Role of nurses *Hayley Pryse-Hawkins (London)*
13:00–14:15	*Lunch and Meet the Experts Sessions*
14:15–15:35	**Session 8 (A symposium supported by an educational grant from GE Healthcare)**
	The emerging role of imaging in a complex syndrome
Chairs:	***Sanjay Prasad (London) / John Sanderson (Birmingham)***
14:15–14:35	What is new in echo for heart failure? *Simon Ray (Manchester)*
14:35–14:55	Nuclear cardiology – what do we need to know? *Simon Woldman (London)*
14:55–15:15	Cardiac MRI – role in heart failure *Lisa Anderson (London)*
15:15–15:35	PET – any role at all? *Paolo Camici (London)*
15:35–16:05	*Coffee*
16:05–16:55	**Session 9**
	Debate – heart failure with normal ejection fraction – fact or fiction?
Chairs:	***Suzanna Hardman (London) / Theresa McDonagh (London)***
16:05–16:30	Fact: *John Sanderson (Birmingham)*
16:30–16:55	Fiction: *Andrew Clark (Hull)*
17:00	***Meeting close***

Abstracts

What is primary care delivering? What is and isn't happening?

Ahmet Fuat

Carmel Medical Practice, Darlington

Heart failure is a common condition in primary care, leading to high morbidity and mortality. Accurate diagnosis and management of heart failure requires close working relationships across primary and secondary care.

The Quality Outcomes Framework, introduced in 2004 for primary care, has contributed to considerable progress in the accurate diagnosis and management of patients with heart failure. It would appear that primary care is ensuring that most patients with heart failure receive an angiotensin-converting enzyme inhibitor or angiotensin-receptor blocker; however, few patients are titrated to target doses and many do not receive a beta-blocker. There appear to be gender differences, with younger men more likely to receive all therapies, and there is considerable variability in primary care use of beta-blockers and aldosterone antagonists, in particular.

It does appear that services across primary and secondary care are starting to reduce hospital admissions, but we still have quite a way to go to reduce length of stay and provide uniform palliative care services for our end-stage heart failure patients across the UK.

This presentation will describe the successes and current shortfalls of the primary care management of heart failure.

The national picture for the hospitalised patient

Data from the National Heart Failure Audit

Henry Dargie

University of Glasgow, Glasgow

Not received at time of going to press.

Theresa McDonagh

Royal Brompton Hospital, London

This talk will focus on the results on the National Heart Failure Audit data reported on the 21 October 2009. The complete report can be found on the NHS IC website: http://www.ic.nhs.uk/services/national-clinical-audit-support-programme-ncasp/audit-reports/heart-disease.

Advanced heart failure care – what is being provided and how?

CRT/D/CTX and VADs

Simon Williams

Wythenshawe Hospital, South Manchester

This presentation will briefly outline recent data in all areas of advanced heart failure management (including medical treatment, pacing for heart failure, cardiac transplantation and ventricular assist device therapy) and look at current statistics on the provision and developments of these services in the UK today.

Further reading

Cardiothoracic activity and transplant survival (www.uktransplant.org.uk).

Network Devices Study Group. UK national survey 2007 (www.devicesurvey.com).

Bridging all levels of care – heart failure specialist nurses

What are we providing in the UK in 2009 and who is providing it?

Annie MacCallum

NHS Gloucestershire

Heart Failure Specialist Nurses (HFSNs) continue, in 2009, to contribute to the development of services that improve the quality of life of people with heart failure.

The *National Service Framework for Coronary Heart Disease* (CHD) published in 2000[1] set out a 10-year agenda to modernise and improve the prevention and treatment of CHD in England. Evidence-based clinical guidelines for the accurate diagnosis and treatment of heart failure,[2,3] together with the results of a number of clinical trials showing that HFSNs can improve the management of patients with heart failure[4] and the 2003 Department of Health's Developing Services for Heart Failure[5] led to the recruitment of more HFSNs throughout the UK.

Working as part of multidisciplinary teams, HFSNs in tertiary centres, acute hospital and PCTs are integral to the ongoing development of services: using national guidance and emerging best evidence; incorporating new technologies to meet the needs of local populations; and providing equity of access whatever the age, gender, ethnicity and status of patients.

HFSNs support diagnostic clinics, deliver disease management treatment plans, monitor the effects of therapy, teach self-care strategies and promote the benefits of cardiac rehabilitation. Innovations in practice include: an individual clinical specialist nurse providing support to patients awaiting heart transplantation; the programming and troubleshooting of ventricular assist devices; and specialist nurse clinic support to patients following valve surgery. Specialist nurses in rural areas from the Scottish Highlands to Cornwall are evaluating programmes that include telemonitoring and telephone support for large geographical areas but small populations.

HFSNs are increasingly contributing to the care of advanced heart failure patients following cardiac resynchronisation therapy and the implantation of intra-cardiac defibrillators.

A variety of national initiatives have addressed the palliative needs of heart failure patients. In 2004, the NHS Modernisation Agengy[6] provided a tool kit describing palliative heart failure support that was disseminated widely. The End of Life Care programme (www.endoflifecareforadults.nhs.uk) incorporating the Gold Standards Framework,[7] the Liverpool Care Pathway[8] and Preferred Priorities for Care,[9] and the Department of Health's End of Life Care Strategy[10] include measures promoting high-quality supportive and palliative care for all adults including those with heart failure. A review by two integrated cardiology–palliative care services with HFSNs in Scarborough and Bradford showed that the majority of patients, given an opportunity to express a preferred place of dying, achieved their wish.[11]

The British Heart Foundation (BHF) currently funds, totally or in part, 459 cardiac nurses across the UK. BHF has supported new nursing initiatives for the management of arrhythmia, genetics, advanced heart failure and palliative care, and has facilitated advanced communication training for HFSNs. The 'Better Together' project is a partnership between Marie Curie Cancer Care and BHF, providing community-based nursing support to end-stage heart failure patients.[12]

Communication, collaboration and education remain key components to bridging all aspects of care for heart failure patients. HFSNs are a limited resource, and in order to manage patients with complex disease, communication with, and education of, multidisciplinary teams to provide effective monitoring of patients with stable heart failure remains crucial.

Heart failure specialist nursing has come a long way from beta-blocker titration clinics; with continuing professional development, post-graduate qualifications in heart failure management, clinical examination skills, palliative care and independent nurse prescribing, the HFSN in 2009 is equipped to manage a more complex caseload of patients with heart failure.

These themes will be explored in greater depth during the presentation.

References

1. Department of Health. National Service Framework for Coronary Heart Disease. Modern Standards and service models. The Stationary Office: London 2000.
2. National Collaborative Centre for Chronic Conditions. Chronic Heart Failure: National Clinical Guideline for Diagnosis and Management in Primary and Secondary Care (NICE Clinical Guideline 5). Royal College of Physicians: London 2003.
3. Scottish Intercollegiate Guideline Network 2007 Management of Chronic Heart failure (Guideline 95). Edinburgh: Scottish Intercollegiate Guideline Network 2007.
4. Jaarsma T, Halfens R, Tan F *et al*. Self-care and quality of life in patients with advanced heart failure: the effect of a supportive educational intervention. *Heart Lung* 2000;29:319–30.
5. Blue L, Lang E, McMurray JJ *et al*. Randomised controlled trial of specialist nurse intervention in heart failure. *BMJ* 2001; 323:715–18.
6. NHS Modernisation Agency. Supportive and Palliative Care for Advanced Heart Failure. Department of Health Coronary Heart Disease Collaborative: London 2004.
7. NHS End of Life Care Programme Gold Standards Framework. Available from http://www.goldstandardsframework.nhs.uk.
8. The Marie Curie Palliative Care Institute Liverpool. Liverpool Care Pathway for the dying patient. Available from http://www.mcpcil.org.uk/liverpool_care_pathway.
9. NHS End Of Life Care Programme Preferred Priorities for Care http://www.endoflifecareforadults.nhs.uk/eolc/ppc.htm. Last accessed 21 October 2009.
10. Department of Health. End of Life strategy – Promoting High Quality Care for all Adults at the End of Life: London 2008.
11. Johnson M, Parsons S, Raw J *et al*. Achieving preferred place of death– is it possible for patients with chronic heart failure? *Br J Cardiol* 2009;16:194–6.
12. British Heart Foundation and Marie Curie Cancer Care 'Better Together' programme. Available at http://www.mariecurie.org.uk.

The Inaugural Philip Poole-Wilson Memorial Lecture: Time for a change in heart failure care – towards MI status

Henry Dargie

University of Glasgow, Glasgow

The untimely death of Professor Philip Poole-Wilson earlier this year shocked not only his family and friends but also the cardiology fraternity throughout the world, for Philip's influence was, especially in heart failure, truly global.

In the past months many tributes have been paid to Philip the scientist, doctor, family man and friend, but of his many talents his skill as an innovator has been a constant. It was Philip who conceived the idea of a British Society for Heart Failure, of which he was the first Chairman in 1997. This 12th Annual Autumn Meeting of the BSH is a particularly enduring example of that talent. His clear vision, endless energy and unstinting support over much of the life of the BSH are all reflected in its continuing success.

Many of us, including myself, owe much to another facet of his character, a rare generosity of spirit, repeatedly demonstrated in his support of others' aspirations in respect of major grant applications for which his own department would also have been in competition.

I am greatly honoured to be invited to give this first Philip Poole-Wilson Memorial Lecture in which I shall allude among others to several aspects of Philip's work which have helped to shape the modern management of heart failure. I shall seek to illustrate how the implementation of these and other innovations will increasingly contribute to raising the standard of care for patients with heart failure.

In this reflection on the life and times of Philip Poole-Wilson and his abiding professional passion, heart failure, I pay tribute to his personal passion, Mary and their family, without whom much of this might never have happened.

Update on pharmacotherapy

John McMurray

Western Infirmary, Glasgow

Not received at time of going to press.

Advances in diagnosis with biomarkers

Theresa McDonagh

Royal Brompton Hospital, London

This short talk will cover some recent updates in biomarkers for the diagnosis of heart failure. It will focus on new natriuetic peptides and other more novel biomarkers with diagnostic and prognostic potential in heart failure.

What's new for electrical therapy?

Rakesh Sharma

Royal Brompton Hospital, London

Heart failure with left ventricular systolic dysfunction is associated with a high morbidity and mortality. Despite the use of neurohormonal blockade, there remain a considerable number of patients with refractory symptoms at risk of repeated hospitalisation for heart failure and sudden cardiac death. Device therapy (biventricular pacemakers and implantable cardiac defibrillators) has been established as an important therapeutic strategy for selected patients with heart failure. This presentation will address the latest developments in device therapy, including the results of recent clinical trials such as REVERSE (Resynchronization Reverses Remodeling in Systolic Left Ventricular Dysfunction) and MADIT-CRT (Multicenter Automatic Defibrillator Implantation Trial – Cardiac Resynchronization Therapy).

Suggested reading

Cleland JG, Daubert JC, Erdmann E et al. The effect of cardiac resynchronization on morbidity and mortality in heart failure. *N Engl J Med* 2005;352:1539–49.

Epstein AE, Dimarco JP, Ellenbogen KA et al. ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities: executive summary. *J Am Coll Cardiol* 2008;51:934–55.

Goldberger Z, Lampert R. Implantable cardioverter-defibrillators – expanding indications and technologies. *JAMA* 2006;295:809–18.

Linde C, Abraham WT, Gold MR et al. Randomized trial of cardiac resynchronization in mildly symptomatic heart failure patients and in asymptomatic patients with left ventricular dysfunction and previous heart failure symptoms. *J Am Coll Cardiol* 2008;52:1834–43.

Moss AJ, Hall WJ, Cannom DS et al. Cardiac-resynchronization therapy for the prevention of heart-failure events. *N Engl J Med* 2009;361:1329–38.

Tung R, Zimetbaum P, Josephson ME. A critical appraisal of implantable cardioverter-defibrillator therapy for the prevention of sudden cardiac death. *J Am Coll Cardiol* 2008;52:1111–21.

Update on LVADs

Nick Banner

Royal Brompton and Harefield NHS Foundation Trust, Harefield Hospital, Middlesex

Left ventricular assist devices (LVADs) may be used for:

1. short-term support in acute heart failure where myocardial recovery is expected (e.g. myocarditis)
2. maintaining advanced heart failure patients prior to transplantation ('bridge to transplant')
3. long-term treatment of advanced heart failure ('destination therapy')
4. to reverse advanced heart failure and promote myocardial recovery in patients with non-ischaemic dilated cardiomyopathy.

In the UK, the NHS currently funds all of these indications except destination therapy.

Device technology has advanced considerably in recent years. Currently three 'generations' of device are in use:

1. first-generation pulsatile devices that simulate the cyclical ejection of the left ventricle
2. second-generation continuous flow devices
3. third-generation bearing-less continuous flow devices.

The physiology of patients receiving left ventricular support from a second- or third-generation device is altered by the loss of the normal left ventricular ejection pattern and, consequently, there is a reduced pulse pressure.

Most of the implantable devices that are currently available support only the left ventricle, and persistent right heart failure is one of the most serious early complications of LVAD insertion. Other problems include bleeding, thromboembolic events and cardiac arrhythmia. Late complications include haemorrhage, thromboembolic complications, arrhythmia and infection.

Patient selection and the timing of device insertion play a key role in determining the success of LVAD support.

Outpatient management of the LVAD patient requires training in self care, device maintenance and troubleshooting. The patient and/or his/her family must regularly charge batteries, carry spare equipment and batteries at all times, care for the drive line entry site, protect the drive line and take special precautions when showering. Different devices need varying degrees of anticoagulation. Other drug therapy is aimed at controlling systemic blood pressure and, when appropriate, promoting myocardial recovery.

With increasing numbers of patients receiving LVAD support, we are now beginning to see patients developing life-threatening co-morbidities and complications while on support. The care of such patients is throwing up new practical and ethical issues.

Survival during LVAD support as bridge to transplant is good. Registry data indicate that post-transplant survival after bridging is slightly lower than that for patients undergoing de novo transplantation. The REMATCH (Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure) study demonstrated that long-term LVAD support provided better survival than continued medical therapy for patients with very advanced heart failure. Trials that will be reported in the near future are likely to demonstrate even better results with second-generation devices.

Any news on surgical treatment?

John Cleland

University of Hull, Hull

Not received at time of going to press.

Percutaneous valves – an emerging role in heart failure?

Michael Mullen

Royal Brompton Hospital, London

Not received at time of going to press.

Familial DCM

William McKenna

Institute of Cardiovascular Science, University College London

Dilated cardiomyopathy (DCM) was first recognised over 50 years ago. It was originally described as idiopathic. Perceptions of the disease reflected the technology available in the era. Early on, DCM was considered to be a consequence of viral infection. Subsequent hypotheses suggested an immune-mediated pathogenesis, perhaps triggered by acute or persistent viral infection. More recently, it has been recognised to be familial and to have a genetic basis. Reliance on family history alone would indicate that approximately 10% of the disease is familial. Systematic evaluation of first-degree relatives of probands reveals a familial prevalence of 25%. More extensive familial evaluation and prolonged follow-up reveals that at least 50–60% of the disease is familial.

The first disease-causing gene was identified over a decade ago, and there are now over 20 different gene abnormalities recognised. Mutations are found in genes that encode proteins which bind across the cell membrane to the extracellular matrix, in structural elements of the sarcomere, as well as proteins related to the nuclear membrane. The overall concept is that DCM is a disease of the cytoskeleton of the myocyte. The assumption should be made that any offspring of a DCM patient has a 50% chance of inheriting a disease-causing gene. This risk of having disease expression, however, will vary depending on the expressivity of that gene within the family, and in this regard the family history is helpful. Present guidelines for heart failure recommend familial evaluation and, though logical, there is no proof that preclinical diagnosis with initiation of early treatment will prevent or attenuate disease development and/or complications.

Suggested reading

Caforio AL, Mahon NG, Baig MK *et al*. Prospective familial assessment in dilated cardiomyopathy: cardiac autoantibodies predict disease development in asymptomatic relatives. *Circulation* 2007;115:76–83.

Keeling PJ, Gang Y, Smith G *et al.* Familial dilated cardiomyopathy in the United Kingdom. *Br Heart J* 1995;73:417–21.

Mahon NG, Madden BP, Caforio AL *et al*. Immunohistologic evidence of myocardial disease in apparently healthy relatives of patients with dilated cardiomyopathy. *J Am Coll Cardiol* 2002;39:455–62.

Mahon NG, Murphy RT, MacRae CA *et al*. Echocardiographic evaluation in asymptomatic relatives of dilated cardiomyopathy patients reveals preclinical disease. *Ann Intern Med* 2005;143:108–115.

Michels VV, Moll PP, Miller FA *et al*. The frequency of familial dilated cardiomyopathy in a series of patients with idiopathic dilated cardiomyopathy. *N Engl J Med* 1992;326:77–82.

Cardiotoxicity with anthracyclines and trastuzumab

Martin Denvir

University of Edinburgh, Edinburgh

Survival following the treatment of many solid and haemopoietic tumours has improved dramatically in the past 20 years due to better pharmacological and radiotherapy regimens. However, the trade-off for better survival has been the long-term consequences of these therapies. The prevalence of congestive heart failure is approximately 5–8% in patients surviving 10 or more years after a diagnosis of acute lymphoblastic leukaemia, lymphoma or breast cancer. The risk of developing cardiac toxicity is increased with doses of anthracyclines above 450 mg per metre body surface area, previous use of anthracyclines, history of cardiac disease, female sex and chest irradiation. More recently, a completely new family of drugs that inhibit cell signalling pathways involving tyrosine kinase, used to treat breast cancer (trastuzumab) and leukaemia (imatinib), also appear to result in cardiac dysfunction and heart failure. This presentation will outline the clinical epidemiology, presentation and treatment of chronic heart failure syndromes resulting from the use of anthracyclines and trastuzumab.

Restrictive cardiomyopathies

John Sanderson

University of Birmingham, Birmingham

The restrictive cardiomyopathies (RCMs) are a rare group of heart muscle diseases characterised by impaired diastolic filling and stiffness of the heart. The heart is not enlarged but there may be some wall thickening, and although, classically, systolic function was considered normal because of a normal left ventricular (LV) ejection fraction, it is now clear that systolic function is not entirely normal. The major differential diagnosis is constrictive pericarditis but, in this condition, systolic function is truly normal as the obstruction to filling lies outside the heart. Thus, tissue Doppler imaging has been proven to be very useful in distinguishing between the two, demonstrating reduced systolic long axis function in RCM. Cardiac magnetic resonance imaging is also useful as systolic function can be assessed and a thickened pericardium frequently detected (cardiac computed tomography can also now be used). The most common cause of an RCM worldwide is endomyocardial fibrosis (EMF). In the endemic areas of Africa, EMF is the second cause of hospital admission for heart failure in children and young adults after rheumatic heart disease, accounting for up to 20% of all causes. The aetiology is unknown but may be related to activation of eosinophils following parasite infections as eosinophils are known to be toxic to the endocardium. Treatment is difficult; surgical endocardial resection with valve replacement has been done but the operative mortality is high. The prognosis for EMF is poor. Elsewhere, other relatively common causes of RCM are amyloid heart disease, which is sometimes misdiagnosed as non-obstructive hypertrophic cardiomyopathy. Again, tissue Doppler imaging and, more recently, speckle tracking imaging may be helpful in distinguishing the two conditions. Late cases of amyloid heart disease have characteristic clinical features of heart failure (often severe and intractable) with a non-dilated LV, small complexes on the ECG and a thickened myocardium with obvious diastolic dysfunction. Diagnosis of amyloid is by tissue biopsy. Treatment remains largely empirical and symptomatic. In the occasional patient, cardiac transplantation may be life-saving. Idiopathic fibrosis sometimes associated with ischaemic heart disease is another cause of RCM. In children, recent work has demonstrated specific cardiac troponin gene mutations as a possible cause of RCM. Cancer therapy, both chemotherapy and radiation, can also induce RCM, probably through the development of pathological fibrosis. Patients with RCMs are a difficult group, both to recognise and to treat.

Pericardial disease

Alison Duncan

Royal Brompton Hospital, London

This presentation will cover the basic function of the pericardium, and provide a comprehensive explanation of the physiology of important pericardial disease (pericardial effusion, pericardial tamponade and constrictive pericarditis). The diagnoses, using transthoracic echo and transoesophageal echo, will be explored. There will be discussion on the differentiation of constrictive pericarditis and restrictive cardiomyopathy, and a brief overview of postoperative ‘tight’ pericardial disease using physiological echo-Doppler techniques.

Myocarditis

Simon Williams

Wythenshawe Hospital, South Manchester

The diagnosis and management of myocarditis represents one of the most challenging aspects in cardiology. Myocarditis has a variable clinical presentation and progression, ranging from an acute presentation with catastrophic consequences to a more chronic onset of dilated cardiomyopathy. Its pathophysiology is ill understood but is thought to involve activation of the immune system by a causative virus. Diagnosis is difficult and the use of endomyocardial biopsy is controversial. Treatment in the acute phase is supportive and urgent ventricular assist device therapy/cardiac transplantation may be warranted. Treatment in the chronic phase is standard heart failure treatment. Trials of immune system modification and antiviral agents have been disappointing, but further research and understanding of the immune system in heart failure may lead to new therapies in the future.

Further reading

Dennert R, Crijns HJ, Heymans S. Acute viral myocarditis. *Eur Heart J* 2008;29:2073–82.

Fildes JE, Shaw SM, Yonan N et al. The immune system and chronic heart failure: is the heart in control? *J Am Coll Cardiol* 2009; 53:1013–20.

Diuretic resistance

Martin R Cowie

National Heart & Lung Institute, Imperial College & Royal Brompton Hospital, London

Diuretic resistance is a common clinical problem in patients with heart failure, particularly as the syndrome advances. The evidence base for treatment is rather weak, with few randomised trials. In modern practice, the dose of diuretic is reduced to the minimum required to control the tendency for fluid retention, but in some patients the syndrome escapes from control despite increasing the prescribed dose of loop diuretics. There are many potential causes: poor diuretic adherence, excessive dietary Na+ intake, drug interactions (particularly NSAIDs), chronic kidney disease, physiological changes leading to glomerulotubular resistance to the effect of diuretics, co-morbidities and deteriorating underlying cardiac function.

Therapeutic strategies (after appropriate diagnostic work-up) can include: increasing the dose or frequency of loop diuretic, changing the loop diuretic, intravenous rather than oral dosing, continuous infusion rather than bolus dose, sequential nephron blockade with the addition of thiazides to loop diuretics, temporary reduction in renin–angiotensin system inhibition or beta-blockade to allow higher renal perfusion pressure or, in rare cases, short-term intravenous inotropes to rescue the patient. Extracorporeal ultrafiltration is likely to become more routine in clinical practice, although there are practical challenges. The results of trials of new drug classes, such as adenosine or vasopressin receptor antagonists, are awaited.

Hyponatraemia

Andrew Clark

Castle Hill Hospital, Kingston upon Hull

All commonly available diuretics work by increasing sodium excretion in the kidneys. In consequence, a common side effect is electrolyte depletion, with loss of potassium, sodium and magnesium being universal. Usually, serum sodium is maintained within normal limits despite diuretic use (although some form of potassium supplementation is almost always needed, either as direct supplementation or by additional pharmacological measures, such as angiotensin-converting enzyme inhibitors or aldosterone antagonists).

Hyponatraemia is a late event in the course of chronic heart failure, and tends to be seen in patients in whom control of fluid balance is becoming difficult. The appearance of hyponatraemia is a bleak prognostic sign.

Management of hyponatraemia is difficult. In a very fluid-overloaded patient, continuing and intensifying treatment with diuretics may help. Fluid restriction to, perhaps, less than a litre of fluid a day, may also help, but can be very unpleasant for the patient, who is often being made to feel very thirsty by the effects of diuretics and the production of antidiuretic hormone (ADH).

Some physicians have attempted to use infusions of small volumes of solutions containing higher than physiological concentrations of sodium, and have reported some success. However, it appears that any gains made are short-lived, and my anecdotal experience of using 2N saline is not good.

Recent developments include the use of ultrafiltration, which can allow the removal of large volumes of fluid fairly rapidly. There is some evidence to suggest that ultrafiltration in patients with hyponatraemia may be helpful in increasing serum sodium. The vasopressin antagonists (‘vaptans’) are perhaps the agents with greatest promise. They work by blocking the effects of ADH (arginine vasopressin or AVP) on the collecting ducts in kidney, thereby allowing ‘aquaresis’, that is, loss of water without sodium. The limited data available to date suggest that the ADH antagonists may have a striking effect on serum sodium in patients with marked hyponatraemia.

Pulmonary hypertension

John Wort

Royal Brompton Hospital and Imperial College, London

Pulmonary hypertension (PH) associated with left-sided heart disease (LHD) is common and associated with a poor prognosis. The pathogenesis is likely to include a passive venous component and an active component that includes vasoconstriction and vascular remodelling. Assessment of patients with PH and LHD is complex. The differentiation of patients with true pulmonary arterial hypertension (PAH) and those with PH caused by diastolic left ventricular (LV) dysfunction, for instance, can be very difficult. Treatment options other than optimising the underlying condition are, at present, limited. However, in selected patients with LV disease and PH, it is possible that drugs used in the treatment of PAH may be useful.

Heart failure in ACHD

Lorna Swan

Royal Brompton & Harefield NHS Trust, London

Ventricular dysfunction and clinical heart failure are inevitable for many patients with congenital heart disease. This is particularly true for complex patients with a single or systemic right ventricle. In this setting, heart failure is a leading cause of premature death, and the presence of ventricular dysfunction is known to adversely impact on outcome.[1,2] In Tetralogy of Fallot, for example, the addition of left ventricular dysfunction more than doubles mortality in young adults.[3] The aetiology of ventricular dysfunction in this population is often multifactorial. This includes the effects of intrinsic ventricular dysfunction, chronic volume and pressure loading, ischaemia, arrhythmia and the effect of previous cardiac surgery.

The diagnosis of heart failure in this setting is complex. Symptoms of effort intolerance, lethargy and breathlessness may accompany ventricular impairment. However, these symptoms may also be due to coexisting haemodynamic lesions, inadequate filling or abnormal pulmonary vasculature. A full anatomical and physiological assessment is therefore mandatory prior to targeted treatment of ventricular dysfunction.

Patients with congenital heart disease are known to have many of the manifestations of those with chronic heart failure. This includes neurohormonal activation, cytokine activation, cachexia, arrhythmia and renal impairment.[4,5] It is, however, less certain as to whether traditional heart failure treatments (such as angiotensin-converting enzyme inhibitors and beta-blockers) will be equally effective in this sub-group of patients.[6]

The heterogeneous nature of congenital heart lesions is a major barrier to performing large randomised clinical trials of heart failure treatment. To date, all of the published series in congenital heart disease have been significantly underpowered and unable to detect small beneficial or adverse effects. Caution therefore has to be exercised in the interpretation of their results.[7]

Although there is little of an evidence-base in this population, the majority of congenital cardiologists prescribe heart failure treatment extrapolating from guidelines for acquired heart failure. This is true both for medical therapy and for device therapies. This presentation will discuss the pros and cons of this approach, and give clinical examples of the differences between the congenital population and those with other acquired forms of heart failure. Areas of uncertainty in managing these complex patients and potential pitfalls will be discussed.

References

1. Piran S, Veldtman G, Siu S *et al*. Heart failure and ventricular dysfunction in patients with single or systemic right ventricles. *Circulation* 2002;105:1189–94.
2. Oechslin EN, Harrison DA, Connelly MS *et al*. Mode of death in adults with congenital heart disease. *Am J Cardiol* 2000; 86:1111–6.
3. Ghai A, Silversides C, Harris L *et al*. Left ventricular dysfunction is a risk factor for sudden cardiac death in adults late after repair of tetralogy of Fallot. *J Am Coll Cardiol* 2002;40:1675–80.
4. Bolger AP, Sharma R, Li W *et al*. Neurohormonal activation and the chronic heart failure syndrome in adults with congenital heart disease. *Circulation* 2002;106:92–9.
5. Sharma R, Bolger AP, Li W *et al*. Elevated circulating levels of inflammatory cytokines and bacterial endotoxin in adults with congenital heart disease. *Am J Cardiol* 2003;92:188–93.
6. Vonder Muhll I, Liu P, Webb G. Applying standard therapies to new targets: the use of ACE inhibitors and B-blockers for heart failure in adults with congenital heart disease. *Int J Cardiol* 2004;97(Suppl 1): 25–33.
7. Dore A, Houde C, Chan KL *et al*. Angiotensin receptor blockade and exercise capacity in adults with systemic right ventricles: a multicenter, randomized, placebo-controlled clinical trial. *Circulation* 2005;112:2411–6.

The patient with heart failure and sleep disordered breathing

Anita Simonds

Royal Brompton Hospital, London

The term 'sleep disordered breathing' embraces obstructive sleep apnoea (OSA), central sleep apnoea (CSA) and Cheyne-Stokes respiration. Prevalence studies suggest that OSA affects 4% of men and 2% females,[1] and increases with age. Epidemiological and interventional trials strongly support a causal relationship between OSA and hypertension. A causal relationship between OSA and other vascular disease has not been firmly established but OSA may increase the risk of events. Pathophysiological mechanisms that could explain this link include OSA triggering sustained sympathetic activation, oxidative stress, vascular inflammation and endothelial dysfunction.[2]

Both OSA and CSA can exist in patients with heart failure. Treatment of OSA with nasal continuous positive airway pressure therapy (CPAP) is clearly indicated as this can improve cardiac function and quality of life.[3,4] CSA is more difficult to detect in the clinic as individuals are not usually somnolent. Here, too, the pathophysiological consequences of sleep disordered breathing may contribute to progressive functional decline, rather than act as a marker of disease severity; recent work shows that around 50% of patients with New York Heart Association functional class 2 heart failure have sleep disordered breathing. The Canadian Continuous Positive Airway Pressure for Patients with Central Sleep Apnea and Heart Failure Trial (CANPAP)[5] showed that, unlike in OSA, CPAP did not improve survival in patients with CSA, although a *post-hoc* re-analysis[6] suggests there might be benefit in the subgroup of patients in whom respiratory events were adequately suppressed. A further novel intervention in heart failure patients – adaptive servo ventilation[7] – may be more effective in capturing ventilation, and is undergoing a European multicentre trial (Serve-HF).

References

1. Young T, Palta M, Dempsey J et al. The ocurrence of sleep-disordered breathing among middle-aged adults. *N Engl J Med* 1993;328:1230–5.
2. Verleden GM, Buyse B, Pevernagie D et al. Respiratory somnology: a clinical update. *Eur Respir Rev* 2007;16: 113–4.
3. Kaneko Y, Floras JS, Usui K et al. Cardiovascular effects of continuous positive airway pressure in patients with heart failure and obstructive sleep apnoea. *N Engl J Med* 2003;348:1233–41.
4. Mansfield DR, Gollogly NC, Kaye DM et al. Controlled trial of continuous positive airway pressure in obstructive sleep apnoea and heart failure. *Am J Respir Crit Care Med* 2004;169:361–6.
5. Bradley TD, Logan AG, Kimoff J et al. Continuous positive airway pressure for central sleep apnea and heart failure. *N Engl J Med* 2005;353:2025–33.
6. Artzt M, Floras JS, Logan AG et al. Suppression of central sleep apnea by continuous positive pressure airway pressure and transplant-free survival in heart failure: a post hoc analysis of the Canadian Continuous Positive Airway Pressure for Patients with Central Sleep Apnea and Heart Failure Trial (CANPAP). *Circulation* 2007;115: 3173–80.
7. Teschler H, Dohring J, Wang YM et al. Adaptive pressure support servo-ventilation: a novel treatment for Cheyne-Stokes respiration in heart failure. *Am J Resp Crit Care Med* 2001;164:614–19.

The patient with heart failure and arthritis

Niki Walker

Royal Brompton Hospital, London

The increasing prevalence of heart failure is well described. Arthritis is a common condition that may afflict many of our patients. This talk will describe the potential issues in the often complex pharmacotherapy of these patients. In addition, the detrimental inter-relation of these two conditions will be considered.

The patient with heart failure and atrial fibrillation

Suzanna Hardman

Whittington Hospital, London

Assessing the intrinsic cardiac function of an individual is a pre-requisite to diagnosing heart failure, and can be challenging even in sinus rhythm. When patients present with heart failure and atrial fibrillation, however, it can be difficult to unravel the insult of the rhythm from the underlying cardiac function. With constant interval variation changes in filling pressures, aortic pressures and the inotropic state are all determined on a beat by beat basis and further modified by the preceding sequence of a number of intervals. Yet patients with heart failure and atrial fibrillation may range from those with normal cardiac function (if and when sinus rhythm is restored) to those with severe persistent underlying muscle dysfunction, and at presentation these may be difficult to distinguish. Furthermore, the combination of heart failure and atrial fibrillation is most common in the elderly, where the co-existence of other conditions may additionally confound the clinician.

In both instances the *pulsus irregularis continualis* is contributing to the acutely compromised patient and strategies are needed, both acutely and longer term, to optimally manage these patients, which will include reducing the thromboembolic risks, identifying and treating triggers, establishing rate control and, for some, cardioversion, ablation and other invasive strategies.

This presentation will try and approach the complexities of the subject with more logic and less emotion than is sometimes apparent in the acute management of these patients.

The patient with heart failure and diabetes

Mark Kearney

University of Leeds, Leeds

Up to 25% of patients with chronic heart failure (CHF) will carry the additional burden of type 2 diabetes mellitus. We recently completed a prospective cohort study of 630 consecutive patients with CHF, examining mortality, morbidity and response to therapies. Using this sample of patients, this presentation will describe outcomes and the response to contemporary therapies in patients with CHF and type 2 diabetes. The presentation will also highlight potential new targets for the treatment of patients with CHF and diabetes, and will examine different pathophysiological features of patients with type 2 diabetes and CHF.

Role of outpatient review

Andrew Clark

Castle Hill Hospital, Kingston upon Hull

Far too many patients are brought to follow-up clinics in hospitals. Bearing in mind the nature of chronic illness, and how it predominantly affects older people, it's unlikely that many doctors have a proper appreciation of how disruptive such visits can be. The problem is particularly well illustrated by watching how junior doctors manage patients – the traditional reliance on a 3- or 6-month review forces someone else to make a decision. The heart failure clinic follow-up should therefore have some purpose.

Clinical assessment is important: how is the patient progressing? Has anything new happened, or has an additional comorbidity intervened? Careful assessment of drug therapy is vital at each visit, particularly in the first year or so after diagnosis. Instructions on the uptitration of drugs are often not followed in primary care, and the review is a key opportunity to put this right. Additional drug concerns include the impact of treatment for other conditions on heart failure management, and the elimination of unneeded drugs.

Consideration of device therapies is important, too: new left bundle branch block develops in around 10% of patients with heart failure a year, and the patient for whom a device was inappropriate last year may need one now. A 12-lead ECG should be performed at least yearly – with the additional aim of detecting arrhythmia. Urea and electrolytes should be checked, together with haemoglobin and any targeted blood tests, as appropriate.

An important part of the visit is reassessing prognosis and discussing with the patient and their carers any concerns they may have over the diagnosis, prognosis and treatment.

For the future, it is possible that telemonitoring may take on some of these roles, particularly in the management of care over relatively short time periods. The remote recording of weight, blood pressure and heart rate helps guide day-to-day modulation of therapy. However, the properly planned routine review is invaluable for the patient, and should not be seen as a chore on either side of the clinic desk.

Monitoring with biomarkers

Ahmet Fuat

Carmel Medical Practice, Darlington

Physicians continue to search for one blood test or biomarker that will help them diagnose, prognosticate and guide treatment for heart failure. Natriuretic peptides, in particular B-type natriuretic peptide (BNP), has been proposed as such a biomarker.

However, there are still continuing arguments in the cardiology community about whether BNP-guided monitoring of therapy to improve symptoms and ultimately change outcomes has enough research evidence to support implementation as a strategy. The variability in ranges of normal BNP levels, according to age, sex and renal function among other parameters, is poorly understood by practising clinicians.

This presentation will consider the evidence base looking at recent studies including STARS-BNP (Systolic Heart Failure Treatment Supported by BNP), STARBRITE (Strategies for Tailoring Advanced Heart Failure Regimens in the Outpatient Setting: Brain Natriuretic Peptide versus the Clinical Congestion Score), BATTLESCARRED (NTproBNP-Assisted Treatment to Lessen Serial Cardiac Readmissions and Death), TIME-CHF (Trial of Intensified versus Standard Medical Therapy in Elderly Patients with Congestive Heart Failure) and PRIMA (Can Pro-Brain-Natriuretic Peptide Guided Therapy of Chronic Heart Failure Improve Heart Failure Morbidity and Mortality?). While BNP levels may prove to be a useful tool for guiding therapy, it may be the method by which BNP levels are reduced that matters most in improving outcomes for patients with heart failure.

Telemonitoring

Jill Riley

Royal Brompton & Harefield NHS Foundation Trust, London

Chronic disease management programmes have developed rapidly in an attempt to provide high-quality care to an increasing number of people living with chronic medical conditions. However, not all patients are able to access them. Traditionally based on regular home or clinic visits, innovative methods to extend the reach of such programmes are now urgently required and telemonitoring is developing as one such strategy. The remote monitoring of patients is challenging, not least because of the change in working practice for healthcare practitioners, but there is accumulating evidence that such an approach can be an effective component of high-quality care. Telemonitoring is highly acceptable to patients and provides patient benefit, with studies demonstrating a reduction in mortality in patients with advanced heart failure and greater scheduling of heart failure care.

This presentation will briefly review some of the emerging evidence for telemonitoring and, by drawing on our experiences in North-West London, will discuss some of the practicalities of providing patient follow-up using a telemonitoring service. The potential challenges it provides to both patients and health professionals will be highlighted.

Further reading

Clark R, Inglis S, McAlister F et al. Telemonitoring or structured telephone support programmes for patients with chronic heart failure: systematic review and meta-analysis. *BMJ* 2007;334:942–51.

Cleland JGF, Louis AA, Rigby AS et al. Noninvasive home telemonitoring for patients with heart failure at high risk of recurrent admission and death: the Trans-European Network-Home-Care Management System (TEN-HMS) study. *J Am Coll Cardiol* 2005;45:1654–64.

Dar O, Riley J, Chapman C et al. A randomized trial of home telemonitoring in a typical elderly heart failure population in North West London: results of the Home-HF study. *Eur J Heart Fail* 2009;11:319–25.

Monitoring with implanted devices

Rakesh Sharma

Royal Brompton Hospital, London

The exponential growth of cardiac device implantation necessitates novel methods of surveillance with a view towards optimising device monitoring. As devices become ever more complex, the workload for cardiologists and cardiac physiologists following-up these patients is rapidly increasing. According to international guidelines, implantable cardioverter defibrillator (ICD) patients should be seen at intervals of between 1 and 4 months, depending on the ICD model and clinical status. In addition, the number of recent advisories requires a further increase in follow-up visits that raises the need for the accurate monitoring of device integrity and function.

Recent advances and innovations in telecommunications may offer an alternative to the current practice of device interrogation. This may alleviate the burden of pacing clinics and provide considerable convenience for patients. Although telemonitoring of pacemakers has been used for many years, internet-based remote surveillance systems of ICDs have been introduced only recently. Many studies have shown the ability of remote monitoring to reduce the number of follow-ups, to detect serious device defects and to check on a patient's daily clinical condition. Hopefully, this will enable physicians to respond more rapidly to changes in patient or device status and to more appropriately triage patient care. This presentation will review the current state of play for remote monitoring of implanted devices in patients with heart failure.

Suggested reading

Burri H, Senouf D. Remote monitoring and follow-up of pacemakers and implantable cardioverter defibrillators. *Europace* 2009;11:701–9.

Jung W, Rillig A, Birkemeyer R et al. Advances in remote monitoring of implantable pacemakers, cardioverter defibrillators and cardiac resynchronization therapy systems. *J Interv Card Electrophysiol* 2008;23:73–85.

Orlov MV, Szombathy T, Chaudhry GM et al. Remote surveillance of implantable cardiac devices. *Pacing Clin Electrophysiol* 2009;32:928–39.

Role of nurses

Hayley Pryse-Hawkins

Royal Brompton Hospital, London

The nurse should be an integrated member of a multidisciplinary team. The roles are diverse and should reflect the individual needs of patients and the local healthcare community, protocols and systems.

The nurse's role should reflect the heart failure service's aims and service development plan, mindful of local, national, and international evidence and guidelines, optimising an individual's quality of life and death, whilst managing the expectations of patients, relatives/carers and the wider healthcare community.

Nurses are advocates for individual patients and their healthcare needs. The nurse will assess, plan, implement and evaluate an individual patient's care, and the needs of their client group in the wider healthcare setting.

Nurse's roles and titles will vary according to the local healthcare delivery system and individual patient's needs. The key nurse for any patient may be based in the community, secondary care or a tertiary setting, depending on the specific needs and required skills.

Assessing, co-ordinating, auditing and developing services for heart failure patients are essential components of any heart failure nurse's role.

What is new in echo for heart failure?

Simon Ray

University Hospitals of South Manchester, Manchester

3-D echocardiography

3-D echocardiography has come of age and it is now possible to acquire a complete 3-D dataset of the left ventricle within a single cardiac cycle. This allows for rapid quantification of left ventricular size and ejection fraction, and also sophisticated analysis of the 3-D motion of the left ventricle. Contraction waveform mapping maps the sequence of contraction of the left ventricle, identifying areas that contract late in dysynchronous ventricles and their response to cardiac resynchronisation therapy.

Myocardial mechanics

Myocardial tissue Doppler and 2-D speckle tracking echocardiography have enabled the analysis of abnormalities in ventricular mechanics in heart failure. Speckle tracking is a non-Doppler technique that tracks the complex motion paths of bright echoes within the grey scale image throughout the cardiac cycle. Unlike Doppler-based techniques it can assess motion at any angle to the ultrasound beam and has been used to assess ventricular rotation and twist. Analysis of ventricular mechanics during exercise using speckle tracking in patients with heart failure with normal ejection fraction has revealed complex abnormalities of twist, untwist and longitudinal motion. Technology has now been developed that will allow 3-D speckle tracking analysis to be performed.

Mechanics of flow

Coherent patterns of flow involving the formation of discrete vortices within the left ventricular cavity are an important feature of normal cardiac function. Using contrast echocardiography and a technique known as vector particle image velocimetry, it is possible to visualise and analyse complex flow patterns within the left ventricular cavity. In individuals with impaired systolic function, vortex formation is highly abnormal.

Further reading

Hong GR, Pedrizzetti G, Tonti G et al. Characterization and quantification of vortex flow in the human left ventricle by contrast echocardiography using vector particle velocimetry. *JACC Cardiovasc Imaging* 2008;1:705–17.

Kapetanakis S, Kearney MT, Siva A et al. Real-time three-dimensional echocardiography: a novel technique to quantify global left ventricular mechanical dyssynchrony. *Circulation* 2005;112:992–1000.

Phillips KP, Popović ZB, Lim P et al. Opposing wall mechanics are significantly influenced by longitudinal cardiac rotation in the assessment of left ventricular dyssynchrony. *JACC Cardiovasc Imaging* 2009;2:379–86.

Tan YT, Wenzelburger F, Lee E et al. The pathophysiology of heart failure with normal ejection fraction: exercise echocardiography reveals complex abnormalities of both systolic and diastolic ventricular function involving torsion, untwist, and longitudinal motion. *J Am Coll Cardiol* 2009;54:36–46.

Nuclear cardiology – what do we need to know?

Simon Woldman

The Heart Hospital, London

Nuclear cardiology has a long tradition as an imaging modality in heart failure. Most commonly, myocardial perfusion imaging has been used to define ongoing ischaemia in heart failure and to guide revascularisation. Patients with severe ischaemia can proceed to bypass surgery or percutaneous intervention.

A small minority of patients with heart failure will have so called 'hibernating myocardium'. Myocardial perfusion techniques, especially those using thallium, can detect this entity, allowing a more rational decision on revascularisation therapy. Nevertheless, we need the results of a large randomised controlled trial on this subject and this will be provided when the results of the Surgical Treatment for Ischemic Heart Failure (STICH) Hypothesis 1 trial are published in approximately 18 months.

Finally, there is a large volume of emerging data to suggest that imaging of the sympathetic system using iodine-123 meta-iodobenzylguanidine (MIBG) identifies patients at high risk of death, especially sudden death. The soon-to-be-published results of the ADMIRE-HF (AdreView Myocardial Imaging for Risk Evaluation in Heart Failure) trial will show the excellent sensitivity and specificity of this type of imaging for predicting death. This may allow more rational use of defibrillators.

Cardiac MRI – role in heart failure

Lisa Anderson

St George's Hospital, London

Cardiac magnetic resonance (CMR) has a complementary role to that of echocardiography in heart failure. CMR clearly has the ability to add value in the following situations.

1. Myocardial tissue differentiation (and assessment of cardiomyopathies)
   - infarct assessment and viability
   - characteristic non-endocardial scar in advanced hypertrophic cardiomyopathy (HCM), Fabry's etc.
   - oedema (myocarditis)
   - cardiac iron overload.
2. It is superior to echo in the detection of intraventricular thrombus.
3. Perfusion imaging.
4. Where there is additional intrathoracic or great-vessel pathology.

However, there are also disadvantages.

1. Whereas echocardiography is entirely safe, most CMR scanning requires the administration of gadolinium contrast agents, which can very rarely cause fatal nephrogenic systemic fibrosis when administered in the setting of advanced renal failure.
2. Due to reduced frame rates, information on physiology, filling and valvular function is far inferior to echo.
3. Although CMR-friendly pacing leads are available, they are costly and at present it is not usually possible to repeat CMR scans after pacemaker/ cardiac resychronisation therapy/implantable cardioverter defibrillator implantation.

Although CMR has many benefits, a CMR scan should not be considered a 'one-stop-shop' imaging assessment. Combined imaging departments with joint review of complex cases are likely to provide the best imaging assessment for heart failure patients.

PET – any role at all?

Paolo Camici

Imperial College School of Medicine, University of London, London

The emerging role of imaging in a complex syndrome

The main feature of positron emission tomography (PET) that makes this technique unique is its ability to provide quantitative data. The three main applications of PET to cardiology are for the measurement of myocardial blood flow (MBF), metabolism and innervation.

PET is a complex technique that, to deliver its full potential, requires a cyclotron on site and radiochemistry facilities in addition to specific scanners. Its complexity and costs have limited the use of PET in cardiology to a small number of institutions where primarily the technique has been used for research. PET-based studies have provided a wealth of new pathophysiological information that has led to the definition of previously unknown conditions such as myocardial hibernation and coronary microvascular dysfunction. PET has also contributed significantly to a better understanding of the pathophysiology of different diseases (e.g. hypertrophic and dilated cardiomyopathies). The question that I have been asked to address is: can we use any of the PET scans we have used for research purposes to improve diagnosis and patient stratification? The answer is simple: YES.

I think that quantitative MBF measurement is now ripe for clinical application. Recent reports have demonstrated clearly how quantitative measurement of myocardial perfusion is superior to any semiquantitative approach, mainly because it allows the demonstration of 'global' reductions in maximum MBF in patients with balanced ischaemia, such as those with severe three-vessel coronary artery disease or those with cardiomyopathies. In selected cases, PET could be used to discriminate between physiological and pathological left ventricular hypertrophy, such as that found in athletes in whom the suspicion of hypertrophic cardiomyopathy is often difficult to rule out. Physiological left ventricular hypertrophy has normal coronary microvascular function (i.e. preserved maximum MBF of 3–5 ml/min/g) whereas maximum MBF is severely blunted in most cases of hypertrophic cardiomyopathy.

PET with ^{18}F-fluorodeoxyglucose (FDG) provides very accurate estimates of myocardial viability and can be used clinically in cases in which other, more accessible, techniques provide ambiguous results. Finally, recent studies have begun to provide evidence that measurement of myocardial beta-adrenoceptor density (pmol/g of myocardium) can be used to stratify patients with acute myocardial infarction and preserved ejection fraction at higher risk of developing congestive heart failure at follow-up.

Meet the Expert Sessions

EXHIBITION AREA:
Benjamin Britten Lounge

THURSDAY 26 NOVEMBER 2009

Expert:	**Dr Simon Woldman** (The Heart Hospital, London)
Time:	13:10–13:25
Topic:	Update on the ADMIRE-HF trial
Location:	GE Healthcare exhibition stand

Expert:	**Dr Jay Wright** (Liverpool Heart & Chest Hospital)
Time:	13:25–13:40
Topic:	Heart failure: a web-based clinical decision tool. Could this be the answer?
Location:	Medtronic exhibition stand

FRIDAY 27 NOVEMBER 2009

Expert:	**Professor Martin R Cowie** (National Heart and Lung Institute, Imperial College & Royal Brompton Hospital, London)
Time:	13:30–13:45
Topic:	An update in heart failure
Location:	Takeda exhibition stand

Expert:	**Professor Chim Lang** (Ninewells Hospital & Medical School, Dundee)
Time:	13:45–14:00
Topic:	Making the HR count in cardiovascular disease
Location:	Servier exhibition stand

Expert:	**Dr Paul Kalra** (Queen Alexandra Hospital, Portsmouth)
Time:	14:00–14:15
Topic:	The results of FAIR-HF, a study moving I.V. iron alone in anaemic CHF patients
Location:	Syner-Med exhibition stand

Biographies

Dr Lisa Anderson

Dr Lisa Anderson is Heart Failure Consultant and Honorary Senior Lecturer at St George's Hospital, London, and Heart Failure Lead for the South West London Cardiac Network. Dr Anderson's sub-speciality interest is in cardiac magnetic resonance (CMR) imaging and she is one of three non-invasive imaging cardiologists at St George's Hospital.

Dr Anderson's MD research involved the development of a novel T2* CMR sequence to quantify myocardial iron in thalassaemia. The research was based at the Royal Brompton Hospital where Dr Anderson spent a further 3 years setting up a major project funded by the US National Institutes of Health to implement and validate the sequence overseas. Current research interests include mechanisms of action and optimisation of cardiac resychronisation therapy and transthyretin cardiac amyloidosis.

Dr Jacky Austin

Dr Jacky Austin is Consultant Nurse for Heart Failure and Cardiac Rehabilitation Services and Visiting Fellow at the University of Glamorgan, South Wales. She has held this post since 2004.

Jacky has many years of experience within general intensive care, cardiology and cardiac rehabilitation. For her services to cardiac rehabilitation, Jacky received an MBE in 2003.

Jacky is currently chair of the 'All Wales Nurse Specialist Heart Failure Group'. The heart failure cardiac rehabilitation programme, based at Nevill Hall, Abergavenny, was awarded a British Heart Foundation Excellence Award in December 2005. A research study exploring the spiritual needs of patients with advanced heart failure and their carers is currently in progress.

Jacky is a faculty member of the 'Save a 1000 Lives' campaign in Wales. Reflecting local and national initiatives, this national healthcare quality and safety campaign, launched in April 2008 and supported by the Institute for Healthcare Improvement, has the task of reducing harm and producing sustainable change. Improving the management of patients with chronic heart failure through the introduction of a 'care bundle' is a very welcome inclusion within one of the six content areas of the campaign.

Dr Nick Banner

Dr Nick Banner is Consultant in Cardiology and Transplant Medicine at the Royal Brompton and Harefield NHS 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.

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 immediate-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 is currently chairing a joint BSH and CTAG working group on guidelines for referral for heart transplantation and ventricular assist device support.

Professor Paolo Camici

Professor Camici is Professor of Cardiovascular Pathophysiology and Consultant Cardiologist at the Imperial College School of Medicine, University of London, and Consultant Cardiologist at the Royal Brompton and Harefield Hospital Trust.

Professor Camici's main interests are in the pathophysiology of the coronary circulation and coronary microcirculation, post-ischaemic heart failure and insulin resistance, and imaging (positron emission tomography, magnetic resonance imaging and computed tomography). He is on the Editorial Board of a number of prestigious journals, including the *European Heart Journal* (Associate Editor) and the *Journal of the American College Cardiology* (Imaging). He has published over 300 papers in peer-reviewed journals, including the *New England Journal of Medicine*, *Circulation* and *The Lancet*.

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. More recently, he has become interested in the problems of heart failure as a wasting disease, and the possibility that obesity and high cholesterol may, paradoxically, be beneficial in 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 is a founder member of the BSH, and a member of the Working Groups for Heart Failure and Cardiac Rehabilitation and Exercise Physiology in the European Society of Cardiology.

Dr 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 to 1994, first as a Senior Registrar and subsequently as Senior Lecturer in Cardiology, and as 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, computer tomography and advanced electrophysiology are also in place.

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

Dr Peter Cowburn

Dr Peter Cowburn is a Consultant Cardiologist with a specialist interest in heart failure at Southampton General Hospital. His interest in heart failure began in Glasgow in 1995 as a research fellow studying the haemodynamic effects of endothelin and endothelin receptor antagonists in patients with chronic heart failure. Following specialist registrar training in the Wessex region, he completed an 18-month heart failure/device fellowship in Toronto, Canada, where he trained in cardiac resynchronisation therapy (CRT). He reported the first series of patients to undergo CRT whilst on inotropes with good outcome and has an interest in the haemodynamic effects of CRT.

Peter Cowburn is an active member of the BSH, having served on the Board as a Councillor and then Deputy Chairman (2005–2007 and 2007–2009, respectively). He represented the BSH as one of the clinical experts for the NICE health technology appraisal for CRT. More recently, he has set up a nurse-led programme for in-patient management of heart failure that has achieved a dramatic reduction in inpatient mortality.

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. After studying medicine at Aberdeen University, he trained in cardiology at University College and Imperial College, and undertook a Wellcome Research Training Fellowship and Masters in Clinical Epidemiology.

A founding member and currently Past-Chairman of the BSH, Professor Cowie is also a Board member (and Chair of the Education Committee) of the Heart Failure Association of the European Society of Cardiology (ESC). He was the clinical advisor for the National Institute for Clinical Excellence (NICE) guidelines on the management of chronic heart failure, and advises the Health Care Commission on its heart failure audit work.

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*, T*he British Journal of Diabetes & Vascular Diseases*, and *Cardiovascular Diabetology*. He has contributed chapters to many books.

Professor Henry Dargie

Not received at time of going to press.

Dr Adrian Davies

I have had a great interest in heart failure throughout my 27 years as a consultant, 12 years as a single-handed physician/cardiologist in a busy district, followed by setting up the Regional Cardiothoracic Centre at the James Cook University Hospital, Middlesbrough. As Lead Cardiologist for heart failure services to South Tees, over the past 4 years I have developed and run a ‘one-stop’ heart failure clinic for patients with elevated N-terminal prohormone brain natriuretic peptide referred from primary care, and we have a large experience of this. We now have a team of two GPSIs (Drs Nigel Rowell and Raj Saha) and a team of five heart failure specialist nurses (four based in PCTs). The community-based heart failure screening and assessment clinics for patients with positive brain natriuretic peptide levels run by GPs and specialist nurses, supported by our Trust echocardiographers with a Vivid i machine, have now gone live.

Dr Martin Denvir

Senior Lecturer and Honorary Consultant Cardiologist at the University of Edinburgh and the Royal Infirmary of Edinburgh with interests in acute and chronic heart failure, inherited cardiac conditions and coronary intervention. Lead cardiologist on the MRC SUPREMO trial examining long-term cardiotoxicity following breast cancer therapy.

Dr Alison Duncan

Dr Alison Duncan is Associate Specialist in Echocardiography and clinical lead for echocardiography at The Royal Brompton Hospital in London. She has over 10 years' experience in clinical transthoracic echocardiography and her expertise is in stress echocardiography (physiological and pharmacological). She competed a PhD in 'Stress Echo and Heart Failure' at Imperial College in 2004. Her current research interests include the use of echo in cardiac resynchronisation and pacing optimisation, and the identification of stress-induced mitral regurgitation in the heart failure population.

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 7 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 a 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 affiliated to the Primary Care Cardiovascular Society. This Forum now boasts 100 members, who support each other and meet regularly in clinical symposia.

Dr Suzanna Hardman

Dr Suzanna Hardman is a Consultant Cardiologist with an Interest in Community Cardiology, at the Whittington Hospital, London, where she leads the Heart Failure Services, 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 to 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 sub-specialty training in heart failure, is a member of the current NICE Guideline Development Group for the partial update of the heart failure guidelines and represents the BSH in varied contexts in UK and Europe. A longstanding member of the BSH, she has been elected Councillor, Deputy Chair and Treasurer. She is currently Chair-Elect of the Society and joint programme director of this the 12th Annual Autumn meeting.

Dr Paul Kalra

Dr Paul Kalra is a Consultant Cardiologist at Portsmouth Hospitals NHS Trust. He has a broad interest in all aspects of general adult cardiology, but with a particular sub-specialty interest in the management of patients with heart failure.

Dr Kalra maintains an active interest in medical education and research, and has >60 peer-reviewed publications. He is a co-organiser of a successful annual national Cardio-Renal Conference. He has edited a cardiology text book *Specialist Training in Cardiology*, which was highly commended in the 2006 BMA Medical Book Competition. In 2009, he was elected to the Board of the BSH as a Councillor.

Professor Mark Kearney

Mark Kearney is Professor of Cardiology at the University of Leeds. He was previously Senior Lecturer and BHF Intermediate Research Fellow at Kings College London. His research interests include prognostic markers in patients with chronic heart failure and mechanisms of endothelial dysfunction in heart failure and other metabolic disorders, with a particular focus on the link between insulin resistance and reduced nitric oxide bioavailability.

Mr Asghar Khaghani

Not received at time of going to press.

Mrs Annie MacCallum

Annie is currently Head of Heart Services at NHS Gloucestershire. She gained her cardiology experience in the cardiac units at the Royal Infirmary of Edinburgh, Bristol Royal Infirmary and Gloucestershire Royal Hospital.

Annie also 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.

As a Heart Failure Specialist Nurse in Gloucester, Annie developed the proposal for a county-wide Heart Failure Service for 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 nine Heart Failure Specialist Nurses based in primary care, but with close liaison with acute hospitals and cardiologists. The service is the regionally recommended model for the South West SHA.

Annie was elected to the Board of the BSH in July 2009.

Dr Theresa McDonagh

Dr Theresa McDonagh is a Consultant Cardiologist with an interest in heart failure at the Royal Brompton 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 an active research profile in the epidemiology of left ventricular dysfunction and in the clinical utility of the natriuretic peptides in both the diagnosis and prognosis of heart failure.

Dr McDonagh has been on the board of the BSH for the past 6 years in various capacities, and is now 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 has been part of the group moving the BSH Heart Failure Audit forward.

Professor William McKenna

Dr William McKenna is Professor of Cardiology at University College London (UCL), Director of the Institute of Cardiovascular Science, UCL and Cardiovascular Program Director for UCL Partners.

Dr McKenna was born in Canada and completed a BA at Yale University before graduating from McGill University Medical School. He completed internal medicine training at the Royal Victoria Hospital, Montreal, and, in 1976, moved to the Hammersmith Hospital/RPMS in London to train in cardiology. In 1988, he took up a post as Sugden Senior Lecturer at St George's Hospital Medical School, London and, in 1993, was made Professor of Cardiac Medicine. In October 2000, he was appointed BHF Professor of Molecular Cardiovascular Sciences and, in July 2003, moved to UCL as Professor of Cardiology. He was appointed Clinical Director of The Heart Hospital, London, from September 2004 to August 2008.

His main interests have been in clinical and basic research of the cardiomyopathies. His recent work has contributed to the identification of disease-causing genes in hypertrophic, dilated and arrhythmogenic right ventricular cardiomyopathy, to the establishment of new diagnostic criteria within the context of familial disease and to the establishment of algorithms to identify patients at high risk of sudden death.

Professor John McMurray

Professor John McMurray attended Manchester University from where he graduated, MB ChB (Hons), in 1983. His subsequent training was in Edinburgh, Dundee and Glasgow. He is Professor of Medical Cardiology at the University of Glasgow, based at the BHF Glasgow Cardiovascular Research Centre, and Honorary Consultant Cardiologist at the Western Infirmary, Glasgow. He is President of the Heart Failure Association of the European Society of Cardiology. His primary research interests are in heart failure, atrial fibrillation and coronary heart disease, with a focus on epidemiology, health services research and clinical trials. He also has an interest in socioeconomic determinants of health and outcomes. Professor McMurray is, or was, the principal investigator, member of the executive committee or steering committee member in a number of large trials in heart failure and other cardiovascular diseases. He has published approximately 550 original papers, reviews, book chapters and books. He has also contributed to a number of national and international guidelines and is on the editorial board of several cardiovascular journals.

Dr Michael Mullen

Not received at time of going to press.

Dr Sanjay Prasad

Dr Sanjay Prasad is a Consultant Cardiologist at the Royal Brompton Hospital, London. He has an interest in heart failure and the applications of cardiovascular magnetic resonance imaging.

Ms Hayley Pryse-Hawkins

Hayley has been part of the heart failure multidisciplinary team at the Royal Brompton Hospital, London, for more than 10 years. Prior to this she implemented a heart failure nursing programme at St Mary's Hospital.

She was fortunate to be seconded for part of her role to the BHF as one of their nurse co-ordinators. This enabled her to support a variety of cardiac nurses in a variety of healthcare provider settings, which specifically developed her awareness of the changing needs in the community.

Dr Simon Ray

Dr Simon Ray is Consultant Cardiologist, University Hospitals of South Manchester, and Honorary Reader in Cardiology, University of Manchester. Immediate Past President of the British Society of Echocardiography, Vice President Elect for Clinical Standards, British Cardiovascular Society.

Ms Jill Riley

Jill Riley is Head of Postgraduate Education (Nursing and Allied Professions) at the Royal Brompton Hospital and course director of the MSc Cardio-respiratory Nursing course at Imperial College, London. She also works in Professor Martin Cowie's Health Services Research Group, evaluating the use of remote monitoring in chronic heart failure.

After qualifying in nursing at University College Hospital, London, Jill trained in cardiac intensive care nursing at the Hammersmith Hospital, London, and has clinical experience working in the UK and North America. In 1998, Jill returned to the UK as a lecturer in nursing and took up her current position in 2004.

Dr Nigel Rowell

I have been a GP in Middlesbrough for over 20 years in the Endeavour Practice. I initially aspired to be a physician and never left here after completing my SHO medical rotations. My interest in cardiology developed at that time and it wasn't long before I went on to be a clinical assistant in cardiology, carrying out echocardiograms. Over time, I also developed an interest in commissioning, and am currently the PBC chair for Middlesbrough.

Six years ago I got totally addicted to brain natriuretic peptide and came out of my echo room to set up the heart failure service with Dr Adrian Davies. I now run a community screening clinic for heart failure as well as working at the James Cook University Hospital.

The new thrust towards primary and secondary prevention of cardiovascular disease will, I hope, develop into screening the at-risk groups for heart failure, and this is one of my main areas of interest.

I am very actively involved with the GPSI forum in cardiology and the Primary Care Cardiovascular Society, and spent 4 years on the Board of the BSH, which has been a terrific boost to my career.

I also teach medical students at third-, fourth- and fifth-year level, all of whom are capable of beating me at bowling. My outside interests are scuba-diving, cross-country skiing and photographing wildlife, which I do from a secret hideaway in Norway.

Professor John Sanderson

Professor John Sanderson received his undergraduate medical training at Cambridge University and St Bartholomew's Hospital Medical College, University of London. After graduating in 1973, he undertook postgraduate training at the National Heart and Lung Institute, Brompton Hospital, and the Royal Postgraduate Medical School (Hammersmith Hospital) in London, and was then appointed Lecturer in Cardiovascular Medicine at the University of Oxford, John Radcliffe Hospital 1978–81. During his time as a research fellow at the Hammersmith Hospital he worked for a year in Nigeria at the Ahmadu Bello University where he studied post-partum heart failure in Hausa women. After Oxford, he returned to Africa for 2 years having obtained a Wellcome Trust Lectureship, and worked as part of the St Mary's Hospital-University of Nairobi collaborative programme on heart failure and hypertension. He returned to the UK in 1983 to a post as Consultant Cardiologist at the Taunton and Somerset Hospital, and as Postgraduate Tutor at the University of Bristol. After a sabbatical year in Hong Kong in 1992, he was appointed a Senior Lecturer, subsequently becoming Reader and then Professor of Medicine and Therapeutics, and Head of the Division of Cardiology at the Chinese University of Hong Kong and Prince of Wales Hospital, Hong Kong. In 2005, he was appointed Consultant Cardiologist and Honorary Professor of Cardiology at Keele University School of Medicine at the University Hospital of North Staffordshire. In April 2007, he was appointed Professor of Clinical Cardiology at the University of Birmingham, UK, and Honorary Consultant Cardiologist to the University Hospital Birmingham, Queen Elizabeth Hospital.

Dr Sanderson's main research interest are heart failure, the cardiomyopathies, hypertension, echocardiography (especially the study of diastolic and systolic function) and, more recently, biventricular pacing (cardiac resynchronisation therapy) for heart failure. He has published widely on these subjects, with over 200 papers in international journals, 260 conference abstracts and 32 textbook chapters, and has edited three textbooks including the *Principles and Practice of Clinical Medicine in Asia*. He is Deputy Editor of *Heart,* a member of the editorial board (and guest editor) of the *Journal of the American College of Cardiology*, *European Journal of Heart Failure*, *Evidence-based Cardiovascular Medicine*, *Cardiovascular Drugs and Therapy*, and the *Journal of the Hong Kong College of Cardiology.*

Dr Sanderson has a wide experience of clinical cardiology in a variety of environments. He is a Fellow of the American College of Cardiology, the Royal College of Physicians (previously an international advisor), the Royal Society of Tropical Medicine, the Hong Kong Academy of Medicine and the Hong Kong College of Physicians, and is a member of the British Cardiac Society and the British Hypertension Society.

Dr Rakesh Sharma

Dr Rakesh Sharma is a Consultant Cardiologist at the Royal Brompton Hospital, London. His specialist interests are heart failure and device therapy (biventricular pacemakers and implantable cardiac defibrillators). Dr Sharma has a PhD from the National Heart and Lung Institute, Imperial College, and won the Young Investigator Award from the American Heart Association for his work. His current research interests are in left ventricular remodelling, hibernating myocardium and cardiac resynchronisation therapy.

Dr Anita Simonds

Dr Anita Simonds is a Consultant in Respiratory Medicine with a long-term clinical and research interest in the diagnosis and management of sleep disordered breathing (SDB) and causative pathophysiological mechanisms. She runs Royal Brompton Hospital Sleep Labs and is involved in studies of screening for SDB in heart failure, and ventilatory management approaches.

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 clinical responsibility for the coronary care unit at Leicester Royal Infirmary, a busy 21-bed unit, and for the Leicestershire Heart Failure Service. He is a member of the National Institute for Health and Clinical Excellence Technology Appraisals Committee.

Professor Squire was a Councillor to the BSH from 2001 to 2003, and is currently Treasurer of the Society. 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 100 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 Jackie Taylor

After studying medicine at Glasgow University, Dr Jackie Taylor trained in general medicine and geriatric medicine, developing her interest in heart failure at this formative time of her career. She became a Lecturer in Geriatric Medicine at the University Department in Glasgow, was appointed to a Consultant post in Falkirk and District Royal Infirmary, and currently holds a Consultant post at Glasgow Royal Infirmary.

A past Observer to the Board of the BSH, Dr Taylor also chairs the Heart Failure Sub-Group of the Cardiac Managed Clinical Network for Greater Glasgow and Clyde, and is responsible for developing and delivering the heart failure strategy.

From a clinical perspective, Dr Taylor's main interest is the development of comprehensive multiprofessional services for heart failure patients and, in particular, in improving the organisation of care. She has developed a heart failure clinic and day hospital programme tailored to the needs of older patients. Dr Taylor is a Council Member of the British Geriatrics Society (Scotland) and Honorary Secretary of the Royal College of Physicians and Surgeons of Glasgow.

Dr Niki Walker

Having graduated from the University of Glasgow in 1996, Dr Niki Walker was awarded an MRCP(UK) in 1999 and completed a PhD in 2004. She was appointed Interventional Fellow in Adult Congenital Heart Disease at the Royal Brompton Hospital, London, in 2008, and qualified as a Specialist Registrar in Cardiology and General Medicine, West of Scotland Deanery, in 2009.

Dr Walker is a co-author of the *Oxford Specialist Handbook of Heart Failure* with Dr Theresa McDonagh and Dr Roy Gardner.

Dr Simon Williams

Dr Simon Williams is a Consultant Cardiologist at Wythenshawe Hospital, South Manchester, where he is the clinical lead for heart failure. 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 are currently studying the immune system in heart failure and following cardiac transplantation.

Dr Simon Woldman

Dr Simon Woldman trained in the West of Scotland and at Aberdeen. He was appointed consultant cardiologist at the Ayr Hospital in 2001 and co-wrote a grant application to the Scottish Executive to start up a community heart failure service. He took up a post at the Heart Hospital in London in 2006 and is the clinical lead for heart failure. Dr Woldman is also an expert in nuclear cardiology and is currently President of the British Nuclear Cardiology Society.

Dr John Wort

Dr John Wort is a Clinical Senior Lecturer and Consultant in pulmonary hypertension and intensive care medicine at the Royal Brompton Hospital and Imperial College London.

Exhibitors and Contributors

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BRITISH SOCIETY FOR HEART FAILURE (BSH)

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 nearly 700 members and eight friends. The BSH Board consists of the following members: Dr Theresa McDonagh (Chair), Professor Martin R Cowie (Past Chair), Dr Andrew Clark (Deputy Chair), Dr Suzanna Hardman (Chair-Elect), Professor Iain Squire (Treasurer), Mrs Jane Butler, Dr Paul Kalra and Mrs Annie MacCallum. The Observers to the Board are as follows: Dr John Baxter, Dr Derek Connelly, Mrs Berni Downey, Dr Ahmet Fuat, Dr Jim Moore, Professor John Sanderson.

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INFORMATION CENTRE FOR HEALTH AND SOCIAL CARE

National Heart Failure Audit

The third annual report was published in October and key findings include:

- 68% of Trusts have registered with the audit, which is an improvement from 2005/06 when the Healthcare Commission found only 20% of Trusts met this NSF criteria
- echocardiography was undertaken in 75% of cases and is an improvement from 2007/08 when only 32% of patients received this test
- prescribing of ACE inhibitors (80%) and beta blockers (46%) has improved since 2005–2006 when only 67% of patients were prescribed ACE inhibitors and 28% prescribed beta blockers
- patients admitted to cardiology were younger, more likely to be men and more likely to be prescribed key treatments
- mortality rates are high, with 10.5% inpatient mortality and 30% mortality within the first year of discharge
- patients admitted to cardiology had significantly higher survival rates even after correction for differences in age, sex, symptoms and treatments.

The report can be accessed via The NHS Information Centre website: http://www.ic.nhs.uk/heartdiseaseaudits

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NHS IMPROVEMENT

NHS Improvement is working in partnership with organisations such as cardiac networks, primary care trusts, secondary and tertiary care providers, and social care across England to work using a variety of approaches in order 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.

The local teams have been set up to deliver the aims of their individual projects and have peer support meetings and site visits on-going. The underpinning mechanism to demonstrate improvement is through the bespoke NHS Improvement system. This can log progress, collect and analyse data and disseminate useful resources.

NHS Improvement is a national improvement programme, working with clinical networks and NHS organisations to transform, deliver and sustain improvements across the entire pathway of care in cancer, cardiac, diagnostics and stroke services.

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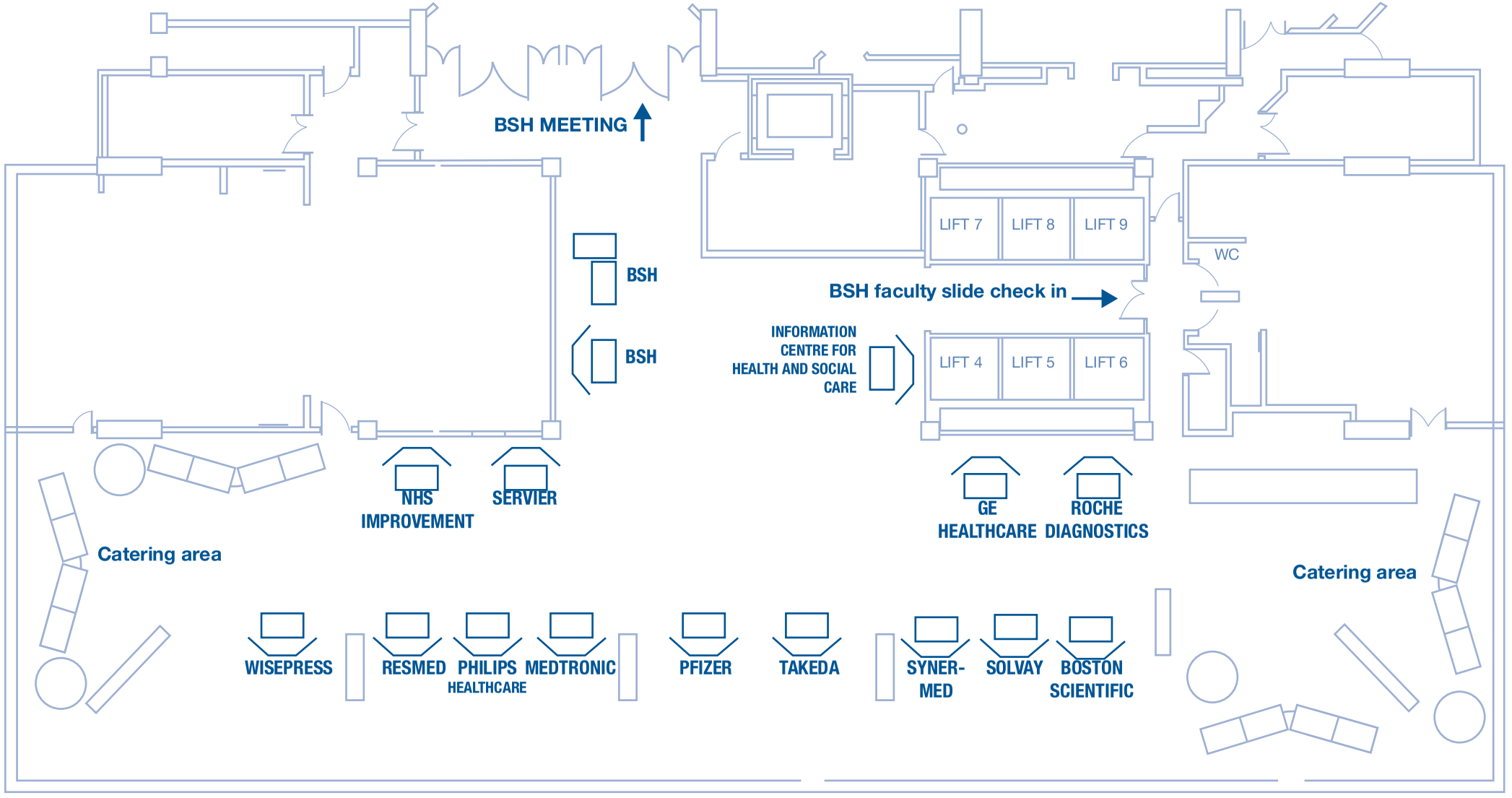
Notes

Queen Elizabeth II Conference Centre, London

Benjamin Britten Lounge

12th BSH Annual Autumn Meeting, 26–27 November 2009

Exhibition Plan

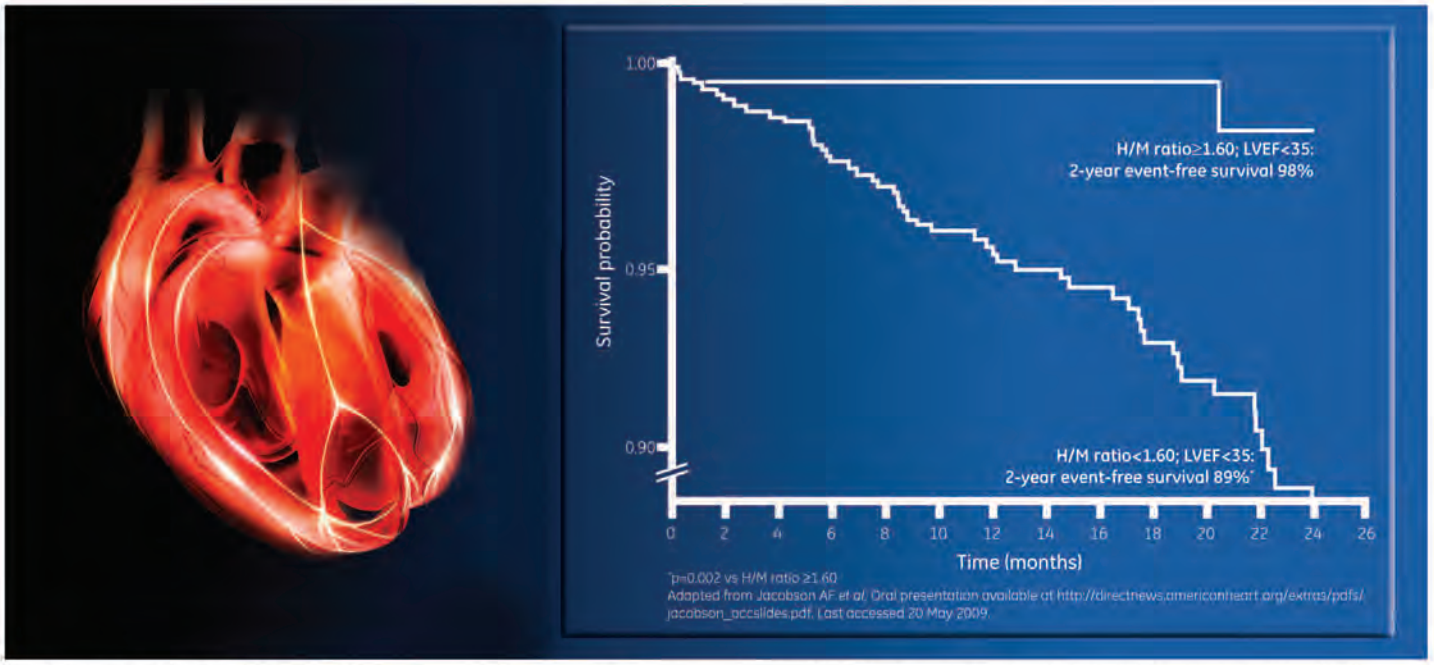


GE Healthcare

Changing Heart Failure Risk Assessment

AdreView is a powerful diagnostic imaging agent providing an additional insight into heart failure:[1]

- Assesses cardiac sympathetic innervation
- May predict heart failure progression, arrhythmias and cardiac death
- May provide additional prognostic information over LVEF
- May help patients' risk-stratification and clinicians' management decisions



Heart/Mediastinum ratio: Ratio of total heart uptake of AdreView measured as radioactive counts per imaging pixel, to the same measurement in a region without specific uptake of AdreView, i.e. the upper mediastinum.

1. Jacobson AF *et al.* Oral presentation available at http://directnews.americanheart.org/extras/pdfs/jacobson_accslides.pdf. Last accessed 20 May 2009.

GE imagination at work

AdreView™ Iobenguane I 123 Injection

PRESCRIBING INFORMATION AdreView, 74 MBq/ml solution for injection. *Please refer to full national Summary of Product Characteristics (SPC) before prescribing. Indications and approvals may vary in different countries. Further information available on request.* **PRESENTATION** Vials containing 74 MBq/ml Iobenguane (^{123}I) at calibration date and hour. Available pack size: 37 to 740 MBq. **DIAGNOSTIC INDICATIONS** • Diagnostic scintigraphic localisation of tumours originating in tissue that embryologically stems from the neural crest. These are pheochromocytomas, paragangliomas, chemodectomas and ganglioneuromas. • Detection, staging and follow-up on therapy of neuroblastomas. • Evaluation of the uptake of Iobenguane. The sensitivity to diagnostic visualisation is different for the listed pathological entities. Pheochromocytomas and neuroblastomas are sensitive in approx. 90% of patients, carcinoids in 70% and medullary carcinoma of the thyroid (MCT) in only 35%. • Functional studies of the adrenal medulla (hyperplasia) and the myocardium (sympathetic innervation). **DOSAGE AND METHOD OF ADMINISTRATION** For adults the recommended dosage is 80-200 MBq, higher activities may be justifiable. Children under 6 months: 4 MBq per kg body weight (max. 40 MBq), the product must not be given to premature babies or neonates. Children between 6 months and 2 years: 4 MBq per kg body weight (min. 40 MBq). Children over 2 years: a fraction of the adult dosage should be chosen, dependent on body weight (see SPC for scheme). No special dosage scheme required for elderly patients. **CONTRAINDICATIONS** Hypersensitivity to the active substance or to any of the excipients. Must not be given to premature babies or neonates. **WARNINGS AND PRECAUTIONS** This medicinal product contains benzyl alcohol. Benzyl alcohol may cause toxic reactions and anaphylactoid reactions in infants and children up to 3 years old. Administer dose intravenously over several minutes. Monitor the patient constantly during administration as, in theory, iobenguane uptake in the chromaffin granules may induce a hypertensive crisis due to noradrenaline secretion. Image 24 and 48 hours after administration. Drugs known or expected to reduce the iobenguane(^{123}I) uptake should be stopped before treatment (usually 4 biological half-lives). Thyroid blockade is started 24-48 hours before the iobenguane(^{123}I) is administered and continued for at least 3 days. Blockade by potassium perchlorate is achieved by administration of approx. 400 mg/day. Blockade by potassium iodide, potassium iodate or Lugol solution must be performed with an equivalent of 100 mg of iodine/day. Radiopharmaceuticals should only be used by qualified personnel with appropriate government authorisation and should be prepared using aseptic and radiological safety requirements. **INTERACTIONS** Decreased uptake was observed under therapeutic regimens involving the administration of reserpine, labetalol, calcium-channel blockers (diltiazem, nifedipine, verapamil), tricyclic antidepressives (amitryptiline, imipramine and derivatives), sympathomimetic agents (present in nasal decongestants, such as phenylephrine, ephedrine or phenylpropanolamine), cocaine and phenothiazine. These drugs should be stopped before administration of iobenguane (^{123}I) (usually for four biological half-lives to allow complete washout). Nifedipine (a Ca-channel blocker) is reported to prolong retention of iobenguane. **PREGNANCY AND LACTATION** Radionuclide procedures carried out on pregnant women also involve radiation doses to the foetus. Any woman who has missed a period should be assumed to be pregnant until proven otherwise. Only imperative investigations should be carried out during pregnancy, when likely benefit exceeds the risks incurred by mother and foetus. If administration to a breast feeding woman is necessary, breast-feeding should be interrupted for three days and the expressed feeds discarded. Breast-feeding can be restarted when the level in the milk will not result in a radiation dose to a child greater than 1 mSv. **UNDESIRABLE EFFECTS** In rare cases the following undesirable effects have occurred: blushes, urticaria, nausea, cold chills and other symptoms of anaphylactoid reactions. When the drug is administered too fast palpitations, dyspnoea, heat sensations, transient hypertension and abdominal cramps may occur during or immediately after administration. Within one hour these symptoms disappear. Exposure to ionising radiation is linked with cancer induction and a potential for development of hereditary defects. For diagnostic nuclear medicine investigations the current evidence suggests that these adverse effects will occur with low frequency because of the low radiation doses incurred. **DOSIMETRY** –The effective dose equivalent resulting from an administered activity amount of 200 MBq is 2.6 mSv in adults. **OVERDOSE** The effect of an overdose of iobenguane is due to the release of adrenaline. This effect is of short duration and requires supportive measures aimed at lowering the blood pressure. Maintain a high urine flow to reduce the influence of radiation. **INSTRUCTIONS FOR USE** Swab stopper with suitable disinfectant before removal of dose, then store at 2-8°C, use within one working day **MARKETING AUTHORISATION HOLDER** GE Healthcare Limited, Little Chalfont, UK. **CLASSIFICATION FOR SUPPLY** Subject to medical prescription (POM). **UK MARKETING AUTHORISATION NUMBER** PL 00221/ 0140. UK PRICE £344/185MBq. **DATE OF REVISION OF TEXT** 31 March 2009.

Adverse events should be reported. Reporting forms and information can be found at www.yellowcard.gov.uk. Adverse events should also be reported to GE Healthcare.

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10-2009 JB3862/OS UK