British Society for Heart Failure

17th Annual Autumn Meeting
27–28 November 2014

Yesterday’s problems, today’s solutions

Fleming Room, Queen Elizabeth II Conference Centre, London

Website: www.bsh.org.uk
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Programme and Abstracts
The BSH is grateful to the following for meeting-specific contributions:

**Gold exhibitors:**
- Novartis
- Servier Laboratories

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- Abbott Point of Care
- Abbott Vascular
- Bayer HealthCare
- Medtronic
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- BioControl Medical
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Session 5: Heart failure research/Hyde Park [there are no abstracts for the Hyde Park session]
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This programme has been accredited by the Royal College of Nursing Centre for Professional Accreditation. Accreditation applies only to the educational content of the programme and does not apply to any product. The meeting has been awarded 14 study hours and the reference is 5841. The meeting has been approved by the Federation of the Royal Colleges of Physicians of the United Kingdom for 11 category 1 (external) CPD credits and the code is 91219.

Please note that photography, video and audio recording of the sessions and slides of this meeting is strictly prohibited. For scientific and/or technical reasons the BSH programme directors reserve the right to make any change to the programme. The BSH cannot accept responsibility for personal accidents, or loss or damage to private properties of participants and exhibitors at the BSH Annual Autumn Meeting. Participants and exhibitors are advised to make their own arrangements if they consider it necessary.
Programme – Day One  THURSDAY 27 NOVEMBER 2014

Programme directors: Roy Gardner (Glasgow) / John McMurray (Glasgow) / Jackie Taylor (Glasgow)

09:00–09:30  Registration

09:30–09:40  Introduction  Andrew Clark (Hull)

09:40–11:00  Session 1: New trials and guideline updates  
(Supported by an educational grant from Servier Laboratories)
Chairs: Peter Cowburn (Southampton) / Paul Kalra (Portsmouth)

09:40–10:00  The National Audit  Theresa McDonagh (London)
10:00–10:20  Clinical trials update  John McMurray (Glasgow)
10:20–10:40  NICE guidance: acute heart failure  Suzanna Hardman (London)
10:40–11:00  NICE guidance: CRT and ICDs  Roy Gardner (Glasgow)

11:00–11:30  Coffee

11:30–12:30  Session 2: Dealing with common non-cardiac co-morbidities – case-based problems
Chairs: John McMurray (Glasgow) / Jackie Taylor (Glasgow)
Panel: Andrew Clark (Hull) / Annie MacCallum (Gloucestershire) / Theresa McDonagh (London) / Nigel Rowell (Middlesbrough)

11:30–11:45  Anaemia  Callum Chapman (Twickenham)
11:45–12:00  Sepsis  Jonathan Dalzell (Glasgow)
12:00–12:15  Renal impairment  Phil Kalra (Manchester)
12:15–12:30  Sleep disordered breathing  Anita Simonds (London)

12:30–13:50  Lunch and Meet the Expert Sessions

13:50–14:50  Session 3: Uncertainties, myths and dogmas  
(Supported by an educational grant from Novartis)
Chairs: Roy Gardner (Glasgow) / John McMurray (Glasgow)

13:50–14:05  Demographic dogma  Nigel Rowell (Middlesbrough)
14:05–14:20  Sodium and water restriction is good  Paul Kalra (Portsmouth)
14:20–14:35  Anticoagulation in heart failure  Lindsey Tilling (London)
14:35–14:50  Lower cholesterol and HbA\text{1c} are better  Andrew Clark (Hull)

14:50–15:50  Session 4: Diagnostic dilemmas
Chairs: Ceri Davies (London) / Lindsey Tilling (London)

14:50–15:05  Respiratory or cardiac dyspnoea?  Michael Polkey (London)
15:05–15:20  HF-PEF or obesity?  Mark Petrie (Glasgow)
15:20–15:35  Atrial fibrillation or HF-PEF?  Alison Seed (Blackpool)
15:35–15:50  Dilated cardiomyopathy – idiopathic or specific?  Joanne Simpson (Glasgow)

15:50–16:20  Tea

16:20–17:25  Session 5: Heart failure research/Hyde Park
Chairs: Andrew Clark (Hull) / Iain Squire (Leicester)

16:20–16:45  Young Investigators’ Award (YIA)
16:20–16:26  Variation in referral for specialist follow-up and 30-day mortality in patients hospitalised with heart failure in England and Wales  Connor Emdin (Oxford)
16:26–16:32  Blood pressure and rate of rise of blood pressure in mid-life and body mass index and duration of overweight from early adult life predict impaired diastolic function in the elderly (The Medical Research Council National Survey of Health and Development)  Arjun Ghosh (London)
Systemic cardiovascular effects of intravenous urocortin 2 and urocortin 3 in patients with heart failure and healthy volunteers  

Colin Stirrat (Edinburgh)

Hot-line session  

Ahmet Fuat (Darlington)

Hyde Park presentations  

Divaka Perera (London)

Revascularisation in ischaemic cardiomyopathy: all STICHed up or about to be REVIVED

Acute heart failure care – best left to the non-experts

Paul Callan (Hull)

Pitfalls in decision making: how to avoid being seduced by snakes in suits by thinking slowly!

Angus Nightingale (Bristol)

17:25–18:30 Cheese and wine reception

Programme – Day Two FRIDAY 28 NOVEMBER 2014

08:30–08:55 BSH Annual General Meeting (BSH members only)  
Chairs: Andrew Clark (Hull) / Simon Williams (Manchester)

09:00–10:20 Session 6: Frightening calls & consultations  
Chairs: Roy Gardner (Glasgow) / Suzanna Hardman (London)

09:00–09:20 Heart failure in pregnancy

Lorna Swan (London)

09:20–09:40 The patient with congenital heart disease

Niki Walker (Glasgow)

09:40–10:00 Scary arrhythmias

Derek Connelly (Glasgow)

10:00–10:20 The patient with cancer

Theresa McDonagh (London)

10:20–10:50 Coffee

10:50–12:00 Session 7: Problem drugs  
Chairs: John Baxter (Sunderland) / Annie MacCallum (Gloucestershire)

10:50–11:05 Anticancer therapies

Simon Williams (Manchester)

11:05–11:20 Prescribed drugs

Iain Squire (Leicester)

11:20–11:35 Over the counter medication & alternative therapies

Steve McGlynn (Glasgow)

11:35–11:50 Compliance

Paul Forsyth (Glasgow)

11:50–12:00 Discussion

12:00–13:20 Lunch and Meet the Expert Sessions

13:20–14:40 Session 8: Hearts and minds  
Chairs: Theresa McDonagh (London) / John Sharp (Glasgow)

13:20–13:40 Anxiety & depression

John Sharp (Glasgow)

13:40–14:00 Delirium/confusion

John Baxter (Sunderland)

14:00–14:20 Cognitive impairment (presented by the BSH Research Fellow)

Jane Cannon (Glasgow)

14:20–14:50 Tea

14:50–16:25 Session 9: Devices and surgery today and tomorrow  
Chairs: Roy Gardner (Glasgow) / Simon Williams (Manchester)

14:50–15:10 CRT, ICDs and implanted monitors – where next?

Ninian Lang (Glasgow)

15:10–15:25 Devices in pipeline

Stephen Pettit (Papworth)

15:25–15:50 New surgical approaches

Nawwar Al-Attar (Glasgow)

15:50–16:20 State of the heart

Christian Latrémouille (Paris)

16:25 Meeting close  

John McMurray (Glasgow)
MEET THE EXPERT SESSIONS
EXHIBITION AREA – BENJAMIN BRITTEN LOUNGE

THURSDAY 27 NOVEMBER 2014

Expert: Professor John Cleland (Imperial College, London)
Topic: Managing LVSD – guidelines & practice
Location: Servier exhibition stand

Expert: Dr Simon Williams (Wythenshawe Hospital, Manchester)
Time: 13:34–13:44
Topic: Device selection made easy
Location: Medtronic exhibition stand

FRIDAY 28 NOVEMBER 2014

Expert: Dr Alexander Lyon (Royal Brompton Hospital, London)
Time: 12:40–12:50
Topic: New insights in the pathogenesis of heart failure: the neurohormonal hypothesis
Location: Novartis exhibition stand

Expert: Dr Derek Connelly (Golden Jubilee National Hospital and Glasgow Royal Infirmary, Glasgow)
Time: 12:52–13:02
Topic: Translating the evidence into experience
Location: Bayer exhibition stand
The National Audit
Theresa McDonagh (King’s College Hospital, London)

No abstract was required for this presentation.

Clinical trials update
The prospective comparison of Angiotensin Receptor Neprilysin Inhibitor (ARNI) with ACEI to determine impact on global mortality and morbidity in heart failure (PARADIGM-HF) trial
John McMurray (BHF Cardiovascular Research Centre, University of Glasgow)

BACKGROUND: LCZ696 blocks the action of angiotensin II and inhibits neprilysin, the enzyme degrading natriuretic and other vasoactive peptides. PARADIGM-HF tested the hypothesis that LCZ696 200 mg bid would be superior to enalapril 10 mg bid in improving clinical outcomes in patients with HF-REF.

METHODS: A randomised, double-blind, parallel-group, active-controlled, event driven, superiority trial. Single-blind active run-in period to ensure that patients tolerated both study drugs, followed by a double-blind phase in which patients randomised 1:1 to LCZ696 or enalapril. The main run-in inclusion criteria were: NYHA class II–IV, LVEF ≤40% (changed December 2010 to ≤35%); BNP ≥150 pg/mL (or NT-proBNP ≥600 pg/mL) or a BNP ≥100 pg/mL (or NT-proBNP ≥400 pg/mL) if HF hospitalisation within the past 12 months. At randomisation: eGFR ≥30 mL/min/1.73 m² (and no decrease >35% during the run-in), SBP ≥95 mmHg, and K+ ≤5.4 mmol/L. Primary endpoint: composite of CV mortality or hospitalisation for HF, but trial also specifically designed to evaluate CV mortality which determined both sample size and interim monitoring boundaries.

RESULTS: 8442 patients randomised at 985 sites in 47 countries. Mean age 64 (SD 11) years; 78% male; 70% NYHA class II/24% class III; LVEF 29 (SD 6)%; beta-blocker 93%; mineralocorticoid receptor antagonist 56%. The primary endpoint was reduced by 20 (95% CI 13–27)% in the LCZ696 group compared with the enalapril group (p=0.0000004); CV death was reduced by 20 (11–29)% (p=0.00008) and HF hospitalisation by 21 (11–29)% (p=0.00008). All-cause death was reduced by 16 (7–24)% (p=0.0009). Both sudden death (relative risk reduction 20%, p=0.008) and death from worsening HF (21%, p=0.04) were reduced by LCZ696. Repeat as well as first admissions for HF were reduced by 23% (p=0.0004). CV admissions as well as admissions for any cause were also reduced significantly by LCZ696. Patient reported outcomes and NYHA class improved significantly in the LCZ696 compared with the enalapril group.

CONCLUSION: Combined inhibition of both the angiotensin receptor and neprilysin is more effective than RAS blockade alone in improving outcomes in HF-REF.

Further reading
NICE guidance: acute heart failure

Suzanna Hardman (Whittington Health and University College (Honorary), London)

The National Institute for Health and Care Excellence (NICE) Acute Heart Failure guidance (187) was published on 8 October 2014. This presentation will focus on those areas identified as key priorities for implementation.

Organisation of care

• All hospitals admitting people with suspected acute heart failure should provide a specialist heart failure team that is based on a cardiology ward and provides outreach services.
• Ensure that all people being admitted to hospital with suspected acute heart failure have early and continuing input from a dedicated specialist heart failure team.

Diagnosis, assessment and monitoring

• In people presenting with new suspected acute heart failure, use a single measurement of serum natriuretic peptides (B-type natriuretic peptide [BNP] or N-terminal pro-B-type natriuretic peptide [NT-proBNP]) and the following thresholds to rule out the diagnosis of heart failure: BNP <100 ng/litre; NT-proBNP <300 ng/litre.
• In people presenting with new suspected acute heart failure with raised natriuretic peptide levels, perform transthoracic Doppler 2D echocardiography to establish the presence or absence of cardiac abnormalities.
• In people presenting with new suspected acute heart failure, consider performing transthoracic Doppler 2D echocardiography within 48 hours of admission to guide early specialist management.

Treatment after stabilisation

• In a person presenting with acute heart failure who is already taking beta-blockers, continue the beta-blocker treatment unless they have a heart rate less than 50 beats per minute, second- or third-degree atrioventricular block, or shock.
• Start or restart beta-blocker treatment during hospital admission in people with acute heart failure due to left ventricular systolic dysfunction, once their condition has been stabilised – for example, when intravenous diuretics are no longer needed.
• Ensure that the person’s condition is stable for typically 48 hours after starting or restarting beta-blockers and before discharging from hospital.
• Offer an angiotensin-converting enzyme inhibitor (or angiotensin receptor blocker if there are intolerable side effects) and an aldosterone antagonist during hospital admission to people with acute heart failure and reduced left ventricular ejection fraction. If the angiotensin-converting enzyme inhibitor (or angiotensin receptor blocker) is not tolerated an aldosterone antagonist should still be offered.

Further reading


NICE guidance: CRT and ICDs

Roy Gardner (Golden Jubilee National Hospital, Glasgow)

The National Institute for Health and Care Excellence (NICE) guidance on ICDs and CRT (TA314) has recently been updated (June 2014).¹

In summary, in those patients with severe LV dysfunction despite optimal medical therapy (ACE inhibitor, beta-blocker and mineralocorticoid receptor antagonist) the following devices should be considered:

<table>
<thead>
<tr>
<th>NYHA class</th>
<th>QRS interval</th>
<th>NYHA class</th>
<th>QRS interval</th>
<th>NYHA class</th>
<th>QRS interval</th>
<th>NYHA class</th>
<th>QRS interval</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>&gt;120 milliseconds</td>
<td>ICD if there is a high risk of sudden cardiac death</td>
<td>ICD and CRT not clinically indicated</td>
<td></td>
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<tr>
<td>II</td>
<td>120–149 milliseconds without LBBB</td>
<td>ICD</td>
<td>CRT-D</td>
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<tr>
<td>III</td>
<td>120–149 milliseconds with LBBB</td>
<td>CRT-P or CRT-D</td>
<td>CRT-P</td>
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<tr>
<td>IV</td>
<td>≥150 milliseconds with or without LBBB</td>
<td>CRT-D</td>
<td>CRT-P</td>
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</table>

LBBB, left bundle branch block; NYHA, New York Heart Association.

Reference

Demographic dogma
Nigel Rowell (Endeavour Practice, Middlesbrough)

Heart failure (HF) patients do have a habit of being recycled through medical admissions units. Many will have HF with preserved ejection fraction. But how many are there really or does it just seem a lot? Systems have improved to manage left ventricular systolic dysfunction (LVSD) but what is the prevalence of asymptomatic LVSD – the HF of the future?

The ECHOES study revealed many answers and the HF Finch study showed us what is going on in care and nursing homes. Recent changes to GPs’ contracts now put great emphasis on preventing emergency admissions with a scheme to actively manage patients at high risk of being admitted. How can we pick up HF earlier and is it possible to prevent HF readmissions when instability is inherent in the pathophysiology of the disease?

Sodium and water restriction is good
Paul Kalra (Queen Alexandra Hospital, Portsmouth)

The abstract for this presentation was not submitted before going to press.

Anticoagulation in heart failure
Lindsey Tilling (Harefield Hospital, London)

The importance of anticoagulation in atrial fibrillation (AF) has been well recognised for many years, and various risk calculators exist to assist in predicting the likelihood of stroke. The presence of an impaired ventricle in a patient with AF makes an even stronger case for consideration of anticoagulation. However the role of anticoagulation in patients with heart failure and sinus rhythm is much less well defined.

Several small trials of anticoagulation in heart failure with sinus rhythm conducted in the past were limited by confounding factors including presence of valve disease and AF. More recently a large randomised controlled trial has been published which excluded patients with conditions which were indications for anticoagulation.1 There was no difference in the composite endpoint of intracerebral haemorrhage, ischaemic stroke or death from any cause, but the incidence of ischaemic stroke was significantly lower in the group receiving warfarin versus the group receiving aspirin. The absolute risk reduction was small, however, and this benefit was offset by the increase in bleeding events. This appears to confirm the findings of smaller studies, with no strong evidence to recommend warfarin in patients with heart failure and in sinus rhythm.

There are no real data on the use of novel oral anticoagulant agents (NOAC) in heart failure and sinus rhythm. However, some trial data of NOACs versus warfarin in AF suggest they may lead to fewer bleeding complications; hence, this may indicate a possible beneficial role if used in patients with heart failure without AF.2

AF remains the undisputed strongest indication for anticoagulation, however, but can we be confident that we have identified all of our patients with AF? The ASSERT trial studied a group of patients with pacemakers and hypertension, and found that a third of them had atrial tachycardias of more than six minutes duration which was associated with a 2.5-fold increase in the risk for ischaemic stroke.3 Interestingly less than 30% of this study population had a history of heart failure. Device therapy is likely to become increasingly prevalent amongst the heart failure population, particularly in the wake of the recently updated National Institute for Health and Care Excellence (NICE) guidelines, and this should provide us with a good opportunity to screen patients for atrial arrhythmia.

Finally there remain several unanswered questions with little or no clinical evidence to support decision making. These include the role of anticoagulation in heart failure with preserved ejection fraction, and anticoagulation in heart failure of different aetiologies.

References
Lower cholesterol and HbA$_{1c}$ are better
Andrew Clark (Castle Hill Hospital, University of Hull)

We have evolved unheedingly toward a target-driven culture and a target-driven approach to aspects of health care. Indeed, reaching targets has become part of the mechanism to reward general practitioners for "good" medicine. Two of the targets we pursue are the reduction of cholesterol and the vigorous treatment of type 2 diabetes mellitus with the aim of reducing glycated haemoglobin to as low as 59 mmol/mol.

Is there any evidence to support these practices? More particularly, is there any evidence to support these practices in patients with heart failure? Does any patient have any symptoms due to their “high” cholesterol or HbA$_{1c}$ that we improve by treating them? The pillar of modern health care, evidence-based medicine, surely teaches us that we should be treating only when we know what the effect is: it is startling that we are subjecting patients to potentially life-long medication based on reaching targets for surrogate endpoints without knowing whether or not we are conferring any benefit.

Respiratory or cardiac dyspnoea?
Michael Polkey (Royal Brompton Hospital, London)

Trying to distinguish between cardiac and respiratory causes of dyspnoea may be problematic, particularly since these problems, frequently having common aetiological factors (e.g. cigarette smoking, obesity), may co-exist. Factors favouring a respiratory diagnosis will include normal cardiological investigations, especially the echocardiograph and B-type natriuretic peptide level. Dr Polkey will outline some simple tests which can be used to identify respiratory disease in the clinic, including the chest radiograph and spirometry, and will identify features of rarer respiratory disease which can occur in the context of a normal chest radiograph, including respiratory muscle weakness and the hyperventilation syndrome.

HF-PEF or obesity?
Mark Petrie (Golden Jubilee National Hospital, Glasgow)

The abstract for this presentation was not submitted before going to press.
Atrial fibrillation or HF-PEF?

Alison Seed (Lancashire Cardiac Centre, Blackpool)

We know that patients often present with clinical heart failure (HF) syndrome and atrial fibrillation (AF).

1,2 The National Institute for Health and Care Excellence (NICE) now recommend B-type natriuretic peptide (BNP) measurement in those presenting acutely as well as those with a more insidious presentation of a possible HF syndrome.3,4 HF teams are likely to see more patients in AF, many with less obvious clinical signs of HF.

Some have impaired left ventricular systolic function (LVSD) or valvular disease, but a significant number have preserved ejection fraction (PEF) usually with a history of hypertension.5 Indeed this group often tolerate AF poorly as a result of the important interaction between heart rate, atrial contraction and left ventricular filling.

The question AF or HFPEF must often be answered with regard to symptoms, when we consider rate versus rhythm control strategies for AF and attempt to attribute symptoms accurately to one or the other.2

The same question when applied to diagnosis, certainly for anyone presenting with more than palpitations, is perhaps best answered with a seat on the fence. Should these patients be given a diagnosis of HF ensuring they are offered assessment, management advice and possibly surveillance, from a specialist HF team? Are they best placed to identify the pathophysiology in each case, recommend targeted treatments and predict future risks? Many patients have neurohumoral activation as a target for treatment,5 its benefits not clear upstream of AF in patients with HFPEF7 but so often indicated for blood pressure control and perhaps a defence against HF hospitalisation in patients with AF.5,9 Should these patients be placed on primary care HF registers to ensure supervision of factors most likely to influence stability and predict deterioration? This presentation will review the evidence and understanding that best supports both specialist teams and primary care practitioners in answering these questions.

There are of course very significant resource implications if specialist teams and registers routinely accept patients without LVSD. Many may opt not to. How else can we bring HF syndrome, in the context of AF without impaired ejection fraction, as a significant cause of HF admission out of the shadows?10 At the very least these patients are potential left ventricular systolic dysfunction patients of the future, a distinctly avoidable endpoint for many.

References

Dilated cardiomyopathy (DCM) is an important cause of arrhythmias, sudden cardiac death and heart failure (HF). Labelled ‘idiopathic’ in the absence of an identifiable cause, the extent to which DCM is investigated varies among clinicians and between cardiology centres. The prevailing opinion that aetiology is irrelevant to treatment or outcome is challenged by recent developments in detecting inherited cardiomyopathies, reversible cardiomyopathies and infiltrative causes. While recommendations for the treatment of DCM are currently broadly the same as for HF of any aetiology, the plateau in discovery of new “one size fits all” pharmacological treatments for HF in large-scale trials has reinforced the need for a stratified approach to treatment.

Knowledge of the prevalence of each cause of DCM in a ‘real-world’ cohort is essential to set the scene for the transition to personalised medicine and the development of novel therapeutics targeted to specific disease mechanisms. However, our understanding of the aetiology of DCM in a contemporary, real-life population is limited. Current guidance for investigating DCM lacks an evidence base and consensus. While there are many known causes of DCM (and probably many to be discovered), the exact prevalence of each has never been investigated in an unselected population using comprehensive diagnostic techniques. Pursuing the underlying cause of DCM can directly influence the management of patients and their family members, and this should challenge the current apathy towards identifying the culprit aetiology.

The high residual unmet therapeutic need and multi-causal nature of DCM makes it an attractive condition in which to search for new treatment targets. Greater understanding of the mechanism of DCM and the processes underlying this disease may permit targeted strategies in smaller studies ultimately leading to discovery of new therapeutics. This can be led only by a clear understanding of the mechanism of disease in a real-world cohort of patients with DCM.
Variation in referral for specialist follow-up and 30-day mortality in patients hospitalised with heart failure in England and Wales

Connor Emdin,* Kazem Rahimi for the UNVEIL-CHF Investigators (The George Institute for Global Health, University of Oxford)

**Purpose:** Current US and European guidelines recommend that patients hospitalised with heart failure (HF) are followed up after discharge, but do not specify whether or not this should be with HF specialist services. We investigated referral patterns to specialist services amongst hospitals in England and Wales and assessed whether these differences were associated with 30-day mortality.

**Methods:** Information on follow-up plans after discharge was available for 84,647 HF patients from 176 hospitals. Vital status was determined from the UK national death registry. Using hierarchical statistical models and instrumental variable analysis, we estimated whether different types of follow-up (cardiologist, HF nurse or geriatrician) were associated with 30-day mortality, adjusting for case mix.

**Results:** At the hospital level, rates of referral to cardiologists for follow up varied from 4% to 94%, to HF nurses from 0% to 97% and to geriatricians from 0% to 65%. When heart failure patients were referred for follow-up to a heart failure nurse, to a geriatrician, or to a cardiologist, they were 15%, 15% and 47% less likely to die than patients who were not referred to these specialists (odds ratio [OR] = 0.85, p<0.001; OR = 0.85, p<0.001; OR = 0.53, p<0.001). A patient admitted to one randomly selected UK hospital would have, on average, 2.1-fold odds of receiving referral to a cardiologist for follow up than a second similar patient admitted to another randomly selected hospital (95% confidence interval [CI]: 1.9, 2.3) Use of quintile of hospital preference as an instrumental variable for cardiology referral resulted in a consistent estimate for the effect of cardiology referral on 30-day mortality (OR = 0.65, CI: 0.40, 0.90, p=0.005).

**Conclusion:** Referral at discharge to cardiology services for follow-up varies considerably amongst UK hospitals. At both an individual patient and at a hospital level, referral to cardiology for follow-up is a major determinant of 30-day mortality.

**Conflicts of interest:** None declared.

*Presenting author
Blood pressure and rate of rise of blood pressure in mid-life and body mass index and duration of overweight from early adult life predict impaired diastolic function in the elderly (The Medical Research Council National Survey of Health and Development)

AK Ghosh,1,* R Hardy,2 DP Francis,1 N Chaturvedi,3 J Mayet,1 D Kuh,2 J Deanfield,3 D Pellerin,4 AD Hughes3 (‘International Centre for Circulatory Health, National Heart and Lung Institute, Imperial College, London; ’MRC Unit for Lifelong Health and Ageing, University College, London; ’Institute of Cardiovascular Science, University College, London; ’The Heart Hospital, University College London Hospital NHS Trust)

Purpose: Increased blood pressure (BP) and body mass index (BMI) are associated with worse diastolic function in cross-sectional studies. However, the long-term effects of raised BP/BMI, rate of increase in BP and duration of overweight from early adult life on diastolic function in later life are unknown.

Methods: Our study is the longest running British birth cohort following men and women born in March 1946.1 1653 participants (48% male) underwent echocardiography at age 60–64y (current). E/e’, E/A, e’, e’/a’ and left atrial volume indexed to body surface area were used to assess diastolic function. The relationship between BP at ages 36, 43, 53, 60–64 years and BMI at ages 20, 26, 36, 43, 53, 60–64 years and measures of diastolic function were analysed using linear regression models (adjusted for sex, clinic attended and age). Estimates of the effect of BP or BMI in early life were then further adjusted for confounders (BP or BMI, type 2 diabetes, treatment for hypertension, physical activity and smoking status). The effect of rate of change in BP over 3 time periods (36–43y, 43–53y and 53y–current) on diastolic function was also analysed. Analyses were also carried out replacing BMI at different ages with overweight and then with age at first detection of overweight.

Results: Elevated BP throughout mid-life predicted impaired diastolic function at age 60–64y (Table).2 Effects were independent of current BP, and in case of BP at age 53 years, also independent of other confounders (current BMI, diabetes or treatment for hypertension). Greater rate of change in BP in all 3 time periods also predicted poorer diastolic function at age 60–64y. This effect for the latter 2 time periods [for E/e’ – (43-53y, coefficient 0.23, 95%CI: 0.11 to 0.36, p value <0.001) and (53y–current, coefficient 0.28, 95%CI: 0.16 to 0.40, p value <0.001)] was independent of confounders. Associations remained significant when those who were hypertensive (SBP >140 mmHg) and those on treatment for hypertension were excluded. Increased BMI and overweight from 20y onwards were associated with poorer diastolic function. On including BMI/overweight at 60–64y, the associations remained for BMI/overweight from 36y onwards (for E/e’). Earlier age at first detection of overweight was associated with worse diastolic function.3

Conclusions: Elevated BP from 36 years predicts poorer diastolic function (E/e’) at age 60–64y, independent of current BP. This effect may be mediated by relatively accelerated increases in BP in mid-life, with changes in BP in the fourth decade appearing particularly influential. Patients with high normal BP and/or marked rises in BP in mid-life may need early intervention to prevent future diastolic dysfunction. Increased adult life course BMI is associated with deterioration in diastolic function. Earlier age of first overweight is associated with greater future diastolic dysfunction. This makes early intervention imperative to prevent future diastolic dysfunction associated with weight gain and obesity.

References

Conflicts of interest: None declared.

*Presenting author

Pierpaolo Pellicori,1,∗ Anna Kallvikbacka-Bennett,1 Riet Dierckx,1 Jufen Zhang,1 Paola Putzu,1 Aaron Koshy,1 Vennela Boyalla,1 Ahmed Shoaib,1 Andrew L Clark,1 John GF Cleland1,2 (1Castle Hill Hospital, Hull; 2National Heart & Lung Institute and National Institute of Health Research Cardiovascular Biomedical Research Unit, Royal Brompton & Harefield Hospitals, Imperial College, London)

Aims: Jugular venous distension reflects increased right atrial pressure and is a classic sign of heart failure (HF). However, it can be difficult to assess clinically.

Methods: Out-patients with HF and control subjects enrolled in the SICA-HF study (ClinicalTrials.gov Identifier: NCT01872299) were assessed. Internal jugular vein diameter (JVD) was measured using a linear high-frequency ultrasound probe (10 MHz) at rest, after a Valsalva manoeuvre and during deep inspiration. JVD ratio was calculated as the maximum diameter during Valsalva to that at rest (Figure).

Results: 311 patients (mean age 71 years; mean left ventricular ejection fraction 42%, median (interquartile [IQR] range) NT-proBNP 979 (441–2007) ng/l) and 66 controls were included. JVD (median and IQR range) at rest was smaller in controls (0.16 (0.14–0.20) cm) than in patients with HF (0.23 (0.17–0.33) cm; p<0.001) but similar during Valsalva (1.03 (0.90–1.16) cm vs 1.08 (0.90–1.25) cm; p=0.28). Consequently, JVD ratio was greater in controls (6.3 (4.9–7.6)) than in patients (4.5 (2.9–6.1); p<0.001).

During a median FU of 516 (IQR: 335–622) days, 48 patients (15%) with HF died or were hospitalised for heart failure. In multivariable models, amongst clinical, echocardiographic or biochemical variables, only increasing NTproBNP and ultrasound assessment of internal jugular vein (either at rest or JVD ratio) were independently associated with prognosis. Adding either clinical or ultrasound measurements of right atrial pressures or Log (NTproBNP) to the base model (including age, sex and four variables strongly associated with prognosis in univariable analysis: NYHA (III v II/I), creatinine, haemoglobin and left ventricular ejection fraction (LVEF)) improved the model discrimination; but adding either ultrasound JVD measurements or IVC diameter lead to a greater increase in the c-statistic than NTproBNP.

Conclusions: Ultrasound assessment of the internal jugular vein identifies out-patients with heart failure who have a higher risk of an adverse outcome.

Conflicts of interest: None declared.

Figure. JVD changes and JVD ratio in different patients with HF are shown in the figure (on the left side, for a patient in the lowest NT-proBNP quartile and on the right side for a patient in the highest NT-proBNP quartile).

*Presenting author
Systemic cardiovascular effects of intravenous urocortin 2 and urocortin 3 in patients with heart failure and healthy volunteers

CG Stirrat,* S Venkatasubramanian, T Pawade, A Mitchell, A Shah, NN Lang, DE Newby (Centre for Cardiovascular Sciences, University of Edinburgh)

**Purpose:** Urocortin 2 (UCN 2) and urocortin 3 (UCN 3) are endogenous peptide hormones with an emerging role in the pathophysiology and treatment of heart failure. For the first time, we examined the systemic cardiovascular effects of both UCN 2 and UCN 3 in healthy volunteers and patients with heart failure.

**Methods:** Seven healthy volunteers (Group A) and nine patients with stable chronic heart failure (Group B, New York Heart Association class II and III, left ventricular ejection fraction <35%) on optimal medical therapy underwent non-invasive oscillometric sphygmomanometry and impedance cardiography during incremental intravenous infusions of sodium nitroprusside (0.15/0.5/1.5 µg/kg/min), UCN 2 (0.16/0.48/1.6 µg/min), UCN 3 (5/15/50 µg/min) and matched saline placebo in a randomised double blind two-way cross over study.

**Results:** Other than diastolic blood pressure (78 vs 72 mmHg for Group A and B, respectively, p<0.05), haemodynamic variables were similar at baseline of each infusion and were unchanged by saline placebo infusion (p>0.05 for all). SNP, UCN2 and UCN 3 infusions increased heart rate and cardiac index, and reduced mean arterial pressure and peripheral vascular resistance index (PVRI) in both healthy volunteers and patients with heart failure (p<0.05 for all; Figure 1a). There were no differences in the changes in cardiac index or PVRI between healthy volunteers and patients with heart failure during either UCN 2 or UCN 3 infusions (p>0.05). Increases in cardiac index lasted 1 hour after cessation of UCN 2 and UCN 3 infusions (Figure 1b).

**Conclusion:** Intravenous UCN 2 and especially UCN 3 increase cardiac output and reduce peripheral vascular resistance. This favourable haemodynamic profile suggests that UCN 2 and UCN 3 hold exciting therapeutic potential for the treatment of acute heart failure.

**Disclosures:** Urocortin 2 was provided by Neurocrine Biosciences, Inc.

*Presenting author

![Figure 1a](https://example.com/figure1a.png) Percentage change in heart rate, cardiac index, mean arterial blood pressure and peripheral vascular resistance index with saline placebo, sodium nitroprusside, urocortin 2 and urocortin 3 in Group A – healthy volunteers and Group B – patients with heart failure.

![Figure 1b](https://example.com/figure1b.png) Percentage change in cardiac index at baseline (B), during dose administration (D1-3) and time (min) after dose 3 cessation with urocortin 2 and urocortin 3 in Group A – healthy volunteers and Group B – patients with heart failure.
Hot-line session
A British Heart Foundation initiative: intravenous diuretics in the community

James Beattie,1 Lynda Blue,2 Ahmet Fuat,3,* Hugh McIntyre,4 Mark Dancy,5 Michael Knapton2 (1Heart of England NHS Foundation Trust, Birmingham; 2British Heart Foundation, London; 3University of Durham; 4East Sussex Hospitals; 5Central Middlesex Hospital, London)

Background: Heart failure is a complex clinical syndrome resulting from impairment of the ventricles to fill or eject blood. Left ventricular (LV) dysfunction is commonly due to the effects of coronary disease or hypertension and is a chronic progressive and ultimately fatal condition. Those affected, often elderly, are disabled by fluid retention leading to breathlessness and peripheral congestion. Such individuals frequently require admission for intravenous (IV) diuretic therapy. With an average length of stay of 13 days, these admissions account for about 2% of all NHS bed days.

Methods: Two year pilot programme to assess safe and effective ways for specialist nursing teams to administer IV diuretics in the home or in a day-care setting preventing hospital admissions and improving patient experience. The heart failure study cohort were adults (≥18 years) with either reduced or preserved LV systolic function and exhibited fluid retention refractory to optimal oral diuretic therapy.

Results:
• 126 IV diuretic interventions were administered during the pilot to a total of 96 patients
• 100% of patients and 93% of carers preferred home-based treatment to hospital admission
• 79% of interventions achieved desired outcome of avoiding admission
• 63% achieved target reduction in oedema and/or weight
• 869 bed days saved over pilot duration
• £199,458 net savings over the pilot duration across the 10 sites
• Average cost of £491.13 per intervention

Quotes:
“I know I’m living on borrowed time, so every day is a bonus. I don’t want to spend time in hospital – I want to be at home with my wife” – Heart failure patient

“Everything the nurses promised actually happened – like clockwork” – Heart failure patient

“Getting to know and trust the medical staff allowed for a better, thorough understanding of how and why treatment was administered. Also improved understanding of condition and care needs” – Heart failure patient

Acknowledgement: We are grateful to the heart failure nurse specialists and the other clinicians for their contribution and commitment to this project.

*Presenting author

Heart failure in pregnancy
Lorna Swan (Royal Brompton Hospital, London)

Heart failure is a leading cause of maternal cardiac death. It most commonly occurs in women not known to have pre-existing cardiac disease and is associated with significant maternal and fetal morbidity. Intrinsic myocardial disease, valve disease and congenital lesions are the commonest causes. Acute heart failure frequently occurs in the middle of the second trimester and peri-delivery – both of these time periods present unique management dilemmas for the heart failure team.

The presentation will discuss the commonest causes of acute heart failure and their likely presentation. Quantifying maternal and fetal risk will be discussed, as will tailoring acute heart failure management to the individual circumstances of the pregnancy patient. Particular reference will be made to peri-partum cardiomyopathy and its outcomes in subsequent pregnancies.

The patient with congenital heart disease
Niki Walker (Golden Jubilee National Hospital, Glasgow)

This talk will focus on adults with congenital heart disease (ACHD): paediatric congenital heart failure is a subspecialty worthy of independent discussion.

The success of paediatric cardiac services, both the diagnostic and interventional skills of the cardiologists and operations of the cardiac surgeons, has led to dramatic improvement in the survival of these patients to adulthood. However, very few have achieved a “cure” and so they require ongoing follow-up throughout their lives.

Patients with ACHD face the prospect of disease progression or recurrence, requiring re-intervention for their primary structural concern, or management of the sequelae including arrhythmias and heart failure.

Heart failure in ACHD has many similarities to the general population with heart failure in terms of symptom presentation and impact on quality of life. There are important challenges in the evidence available in planning their management. We will discuss the current management opportunities and also the need for future study. We will also highlight the importance of understanding the physiology of the individual in planning therapeutic interventions.

Further reading
Scary arrhythmias
Derek Connelly (Golden Jubilee National Hospital and Glasgow Royal Infirmary, Glasgow)

Arrhythmias constitute a major diagnostic and therapeutic problem in patients with heart failure. In most cases they can be managed in a standard fashion, following established clinical guidelines. However, specific instances occur where there may be diagnostic difficulties or where the patient fails to respond to standard treatments.

Patients with symptomatic bradycardias, if not drug-induced (or if induced by drugs such as beta-blockers, where there are good reasons for continuing the medication), will often require consideration for device implantation – either a single or dual chamber pacemaker, or if appropriate a cardiac resynchronisation therapy (CRT) pacemaker, with or without defibrillator capabilities.

The management of the patient with a tachycardia depends primarily on establishing the correct diagnosis. Supraventricular arrhythmias may occasionally need to be discriminated from sinus tachycardia. Atrial flutter is almost always amenable to radiofrequency catheter ablation. Atrial fibrillation can often be managed along conventional lines, but some patients may need to be considered for either left atrial catheter ablation or for atrioventricular nodal ablation and implantation of a biventricular pacemaker. Wide QRS tachycardia requires careful ECG and clinical assessment. ECG algorithms (such as the Brugada algorithm1) are often helpful, but all clinicians should bear in mind that, in patients with ventricular disease, a wide QRS tachycardia is far more likely to be ventricular in origin than supraventricular. In these patients, initial therapy (using drugs or cardioversion) needs to be followed by careful decision-making which should take into account the need for appropriate medical therapy for the underlying disease, revascularisation if appropriate, the possible need for ongoing antiarrhythmic drug therapy, whether implantable cardioverter defibrillator or CRT-defibrillator implantation is indicated, and in some cases whether radiofrequency catheter ablation should be considered.

Reference

The patient with cancer
Theresa McDonagh (King’s College Hospital, London)

This talk will cover the main issues related to cancer and heart failure.

It will cover:

1. the risk of developing HF following cancer treatment
2. the main treatment modalities causing HF in cancer patients
3. how to detect LV dysfunction during cancer Rx
4. how to manage the cancer Rx
5. how to manage the HF.
Anticancer therapies
Simon Williams (Wythenshawe Hospital, Manchester)

Although chemotherapy improves outcomes in patients with cancer, some agents have potent effects on the cardiovascular system. There is a need for a structured way to manage these effects which requires collaboration between cardiologists and oncologists: “cardio-oncology”. The most problematic side effect of chemotherapy is heart failure and left ventricular systolic impairment, especially with the use of anthracycline-based agents and trastuzumab. The management and treatment of these effects will be discussed including an illustrative, problematic case.

Further reading

Prescribed drugs
Iain Squire (Glenfield Hospital, Leicester)

It is almost certain, for the vast majority of patients with heart failure, that they will be prescribed drugs in addition to those intended to treat this condition. These other agents may be prescribed long term, or in limited courses in an outpatient or inpatient setting. Many of such drugs will have the potential to interact (unfavourably) with a patient’s heart failure, and other cardiovascular, treatment. There is clear evidence that the number of drugs prescribed is directly related to that patient’s risk of hospital admission; moreover, there is a link between the number of potential drug–drug interactions and the risk of adverse outcome.

This presentation will explore these issues and will consider some specific “problem” prescribed drugs for patients with heart failure.
Over the counter medication & alternative therapies

Steve McGlynn (Western Infirmary, Glasgow)

An accurate medication history is an important aspect of the process of establishing baseline management before making diagnostic or therapeutic decisions. This is reflected in the importance placed on medicine reconciliation as part of the admission and discharge process. In addition to those medicines that are currently or recently prescribed for a patient, it is equally important to determine those medicines a patient is using to self medicate, either in the form of conventional medicines bought ‘over the counter’ (OTC) or complementary and alternative medicines (CAMs) either supplied via a healthcare professional or specialist practitioner, or bought OTC.

Despite attempts by the MHRA to regulate the market, mail order and the internet provide a means of accessing regulated and unregulated CAMs without the intervention of an appropriate practitioner.

A number of OTC medicines may contain ingredients that may be harmful to patients with cardiovascular disease. These include products containing sympathomimetics, caffeine and high concentrations of sodium or potassium. Some deregulated conventional medicines that may be problematic due to their pharmacological action such as non-steroidal anti-inflammatory drugs (aspirin, ibuprofen and naproxen), tranexamic acid, tamsulosin, sumatriptan, mebeverine, hyoscine, simvastatin and azithromycin.

Herbal medicines are the most likely CAM to pose a risk to patients with cardiovascular disease. These remedies are often perceived to be safer than conventional medicines as they are seen as ‘natural’. However a number are known to have significant pharmacodynamic or pharmacokinetic effects that may be important in patients with heart disease and/or impact on the use of conventional medicines. The evidence base supporting the use of these remedies, and information on their physiological effects and safety, is often limited.

The pharmacodynamic effects include fluid retention and hypokalaemia (liquorice), hypertension (e.g. liquorice, yohimbine) and hypotension (e.g. rauwolfia, hawthorn) and potential proarrhythmia (e.g. motherwort, hawthorn, aconite).

Drug interactions involving herbal medicines most commonly affect coagulation, either as an additive effect to antiplatelet or anticoagulation therapy or as a pharmacokinetic interaction with coumarins resulting in both under- (e.g. St John’s wort, ginseng) and over-anticoagulation (e.g. ginkgo, garlic). Additionally, herbal medicines may interact with digoxin and statins to decrease plasma concentrations (e.g. wheat bran, St John’s wort) as well as interfere with the digoxin assay (e.g. Siberian ginseng, danshen).

Although most healthcare professionals may recognise the implications of conventional OTC medicine use, the use of herbal remedies presents the additional problems of unfamiliarity as well as uncertainty over what the patient is taking.

Further reading
Compliance
Paul Forsyth,* Lesley Fleming, Janice Richardson, Richard Lowrie (NHS Greater Glasgow & Clyde, Glasgow)

What do we know?
Heart failure (HF) medication non-adherence increases the risk of mortality and hospitalisation. At least one-third of patients with HF take <80% of prescribed doses, a clinically significant threshold. Given the increasing burden of HF, tackling non-adherence is a priority.

The reasons for non-adherence are complex. Factors such as motivation; routine; memory; and treatment complexity, have significant influence. Social factors (e.g. co-habitation, regular social contact) and other issues (e.g. co-morbidity, physical health barriers, patient satisfaction) may be equally important.

Identifying non-adherence is difficult. Objectively measured adherence independently predicts clinical events; patient-reported adherence does not. However, as yet a ‘gold standard’ measure remains elusive. Routinely available primary care information on prescribing may offer a part-solution. However, insufficient detail on the day-to-day use of these methods limits implementation. The mass automation of repeat prescribing processes also makes interpretation of such datasets difficult.

Once identified, non-adherence can be improved by multifaceted, intensive, repeated patient support particularly involving pharmacists; patient education and self-management training alone is ineffective. Effects dissipate when interventions cease and therefore long-term support is needed.

Research gaps
The extent of the problem of HF medication non-adherence is poorly understood, as studies are limited by small sample sizes and heterogeneity of methods. There are no ‘off-the-shelf’ interventions. Weak evidence supports attempts to address non-adherence and more robust studies are needed. Future research should offer workable ‘real-life’ solutions.

From theory to practice
NHS Greater Glasgow & Clyde has developed a novel approach to supporting non-adherence involving a pharmacy technician. Patients with suspected non-adherence are identified by the HF multidisciplinary team and then screened by the technician over two visits. Patients with confirmed non-adherence, on tablet count, are then visited at home on a repeated basis over six months, to identify and address individual factors associated with non-adherence.

To date, patients are typically male, New York Heart Association class 2/3 and from the most socially deprived communities.

Early evaluation of the service shows improvement in medication adherence. Changes in pulse and natriuretic peptides show favourable trends. Thematic analyses of qualitative interviews suggest patient experiences are overwhelmingly positive. Common barriers to adherence include social isolation; psychological issues (including cognitive decline and addiction); physical barriers (e.g. dexterity); medication supply issues; low health expectations; and a lack of general HF understanding. An emerging theme for improving adherence is the strong need for a health advocate.

A final report will be produced in December 2014.

References

*Presenting author
Anxiety & depression
John Sharp (Golden Jubilee National Hospital, Glasgow)

The prevalence of both depression and anxiety is high in chronic heart failure (HF) (10–60% depression; 11–45% anxiety). Co-morbid depression and anxiety are associated with increased mortality and healthcare utilisation, and impact on functional disability and quality of life. Despite these negative consequences, the identification and management of co-morbid depression and anxiety is inadequate. Psychological therapy is the treatment of choice for depression and anxiety disorders in the general population. However, there is limited evidence for the positive role of psychotherapy in the management of co-morbid depression and anxiety for people with HF. This talk will present a new explanatory model of depression and anxiety in the context of HF and consider how such a conceptualisation might govern and enhance our therapeutic endeavours.

Delirium/confusion
John Baxter (Sunderland Royal Hospital)

It is very important for members of heart failure teams to be familiar with the management of patients with delirium. Delirium is a very common complication of decompensated heart failure and maybe a presenting feature of heart failure. Patients with delirium have a poor prognosis.

This 20 minute talk will focus on three key areas in the management of heart failure patients with delirium/confusion.

1. When should heart failure team members be involved with patients with delirium?
2. How to recognise that your heart failure patient has delirium?
3. Practical advice regarding the management of delirium in heart failure patients.

The talk will give a brief outline of the National Institute for Health and Care Excellence (NICE) delirium guidelines, explain how trusts are required to screen patients for possible delirium and provide outreach teams to deal with heart failure patients who may have delirium.

Clinical teams managing patients must be familiar with the issues raised by the mental capacity act and the deprivation of liberty.

The main focus of delirium management is to identify and treat all underlying causes. Patients need to be managed in an environment sensitive to their needs. They need to be orientated to their unfamiliar surroundings. Ward moves should be avoided. Specific medications and interventions may help very disturbed patients.

Further reading

Cognitive impairment *(presented by the BSH Research Fellow)*

Jane Cannon *(University of Glasgow)*

The clinical syndrome of heart failure imposes an immense burden of symptoms on patients, reduces quality of life and is one of the leading causes of hospitalisation and mortality, particularly in more developed countries. Due to ageing of the general population in these countries and improved survival from coronary artery disease, the prevalence of heart failure is expected to double within the next 40 years. Central to the treatment of heart failure is relatively complex multi-drug pharmacological treatment which requires careful biochemical surveillance and often leads to problems with adherence. Patient self-monitoring also plays a key role in the management of heart failure. Poor adherence is linked to an elevated risk of hospitalisation and death, whereas appropriate self-management may reduce these risks. Adherence and self-management may be jeopardised by cognitive impairment. Cognitive impairment has been reported in a variety of cardiovascular disorders. It is well documented among patients with hypertension, atrial fibrillation and coronary artery disease, especially after coronary artery bypass grafting. This background is relevant to the study of patients with heart failure as many, if not most, have a history of one or more of these co-morbidities.

In this presentation, I will provide an overview of current literature looking at the reported prevalence of cognitive impairment in heart failure, potential pathophysiological processes that may be implicated in its development and screening methods available to the physician in the clinical setting. I will also present an overview of my ongoing clinical research looking at the association between heart failure and cognitive impairment, which has been generously supported through an educational grant from the BSH and Servier.
Implanted cardioverter defibrillators (ICDs) and cardiac resynchronisation therapy (CRT) are well established as important components of the heart failure treatment armamentarium. However, they are expensive and carry an inherent degree of risk from device-related complications. It is, therefore, vital that their use is directed toward the most appropriate patients and that these patients are treated with technologies, techniques and programming algorithms that afford the greatest opportunity for overall benefit.

Advances have been made in our understanding of patient characteristics that confer the greatest potential for benefits from CRT. It is becoming clearer that CRT should not be reserved for those with severe symptoms. Furthermore, compelling evidence reiterates the importance of QRS duration as the fundamental criterion for patient selection. Indeed, there is now evidence of harmful consequences from CRT in those with narrower QRS duration. Results from the recently completed ALSYNC study shed light on the feasibility and outcomes of endocardial left ventricular (LV) lead placement for patients in whom conventional LV lead placement via the coronary sinus is not feasible, or in whom this approach has failed to achieve a clinical response. Whilst newer lead technologies allow greater flexibility for choosing the optimal LV pacing location, current research aims to understand the effects of simultaneous multi-point pacing of the left ventricle. It is hoped that, in addition to the favourable haemodynamic effects that have been observed, this will increase the clinical response to CRT.

Clinical experience with subcutaneous ICDs (i.e. without transvenous leads) continues to accumulate and reassuring data will prompt further expansion of their use in appropriate patients. Potential recipients are primarily patients with challenging vascular anatomy or a high risk of lead-related infection. The introduction of ICDs that are approved for use with whole-body magnetic resonance imaging promises to remove one of the major limiting features to their implantation, especially in patients with congenital heart disease.

It is becoming clear that less is more when it comes to defibrillator shocks. The SIMPLE trial provides good evidence that routine defibrillation threshold testing is unnecessary at the time of most ICD implants. Furthermore, MADIT-RIT provides compelling data to support a conservative defibrillator programming strategy in patients receiving a primary prevention device.

The future use of ICDs and CRT will continue to rely upon refinements of appropriate patient selection, device selection and appropriate programming. The evidence will allow us to be clearer about which patients are unlikely to ever benefit from device therapy. Advances will expand the technical feasibility of implantation whilst aiming simultaneously to maximise clinical response and diminish risk.

Further reading
Devices in pipeline

Stephen Pettit (Papworth Hospital, Papworth)

The first heart–lung bypass machine was designed by John Gibbon in the mid 1950s and used during cardiac surgery. In the 1960s, left ventricular assist devices and total artificial hearts were developed by surgeons such as Michael DeBakey, Domingo Liotta and Denton Cooley. These were large, cumbersome devices and suitable for very short periods of circulatory support while patients remained in the intensive care unit. Life-threatening complications were frequent and outcomes were poor.

Mechanical circulatory support has progressed immeasurably in subsequent decades. Left ventricular assist devices have become widely used for support of patients with advanced heart failure. In the most recent report of a large US registry, more than 10,000 patients have received mechanical circulatory support with survival rates of 80% at one year and 70% at two years. These outcomes are impressive when compared with the natural history of patients with advanced heart failure.

Success is more than survival. Complications, quality of life and treatment burden are important issues during mechanical circulatory support. These issues become even more important during longer periods of support. Many patients agree to receive a left ventricular assist device on the understanding that they will go on to have a heart transplant, but availability of suitable donor hearts is a major limitation.

This presentation will examine mechanical circulatory support devices that are currently in development and explore potential areas in which devices may develop in the coming decades. The challenges that future mechanical circulatory support devices must overcome will be examined.

Further reading


New surgical approaches

Nawwar Al-Attar (Golden Jubilee National Hospital, Glasgow)

Mechanical circulatory support (MCS) has revolutionised the management and outcome of advanced heart failure. MCS can be short or long term, assisting the left and/or right heart with or without respiratory support. Mechanical left ventricular devices started out as bridge to transplantation for patients who deteriorated despite being on maximal pharmacological support and were awaiting a donor heart. Now their use has expanded to destination therapy in patients who are ineligible for cardiac transplantation and have been proven to be superior to any known medical therapy. New advances in pump design and the development of pumps with biocompatible surfaces have paved the way for the total artificial heart. The ultimate device will be totally implantable and autoregulating, heralding a new era of mechanical support in patients with end-stage heart failure. This would allow an off-the-shelf replacement of diseased hearts at a time where scarcity of organs is one of the major limitation of heart transplantation.
State of the heart
Carmat Bioprosthetic Total Artificial Heart
Christian Latrémouille,1,* Daniel Duveau,2 Alain Carpentier1
(1European Hospital Georges Pompidou, Paris, France; 2University Hospital Guillaume and René Laënnec, Nantes, France)

Facing the problem of end-stage heart failure, organ shortage limits the expansion of cardiac transplantation programmes. New devices have to be developed in order to solve this situation, specifically as destination therapy.

The Carmat Total Artificial Heart (TAH) is a single-unit device with bioprosthetic blood-contacting surfaces. It contains a left and right ventricle, each with a blood compartment and an activation-liquid compartment separated by a hybrid membrane. The membrane has processed bovine pericardial tissue on the blood-contacting surface and a polyurethane layer at the liquid-contacting surface. Two electrohydraulic rotary pumps create a systolic and diastolic phase by rapidly reversing the direction of silicon fluid-flow that pushes and pulls the membranes. Pressure sensors in each ventricle provide information on preload and afterload, while ultrasound transducers measure the position of the membranes. An algorithm responds to changes in preload and afterload by adjusting beat rate (35–150 per minute) and stroke volume (30–65 ml). The resulting pulsatile blood flow ranges from 2 to 9 liters per minute, with automated adjustment on the right side to correct for the bronchial circulation. Electronics and microprocessors are contained inside the TAH. Bioprosthetic valves (Edwards Lifesciences, Irvine, CA, USA) at the inlet and outlet of each blood compartment maintain unidirectional flow. The prosthesis is partially surrounded by a flexible polyurethane compliance bag that contains the actuating liquid. A percutaneous driveline delivers power to the TAH and retrieves information on device performance. The driveline connects to a console displaying device performance data and alarms, and containing an uninterrupted power supply.

After preclinical study in calves, the authorisation of a feasibility clinical study was accorded by French Regulatory Affairs Department in September 2013. The first implantation in man was performed at the Georges Pompidou European Hospital in Paris in December 2013 followed by a second one in August 2014 at Nantes University Hospital.

*Presenting author
Dr John Baxter
Dr John Baxter is a Consultant Geriatrician and Clinical Lead for heart failure in older persons at Sunderland Royal Hospital. He is a past Board Member of the BSH and is a Committee Member of the British Geriatric Society, Cardiovascular Section. He is a Clinical Advisor to the Heart Failure Group of the National Council for Palliative Care.

Dr Paul Callan
I am an ST7 in Cardiology working at Castle Hill Hospital, East Yorkshire. My sub-speciality interests are heart failure and devices.

I trained at Manchester University, then undertook house officer posts in the North West. I spent a year in London working as an A+E SHO, before quickly moving back up North after I was charged over £4 for a haircut. I completed my medical SHO training in South Yorkshire, then moved to Hull where I have spent a very enjoyable 5 years as a cardiology trainee.

I recently completed an MSc in Clinical Trials through the University of London. I am now working on an MD project, in collaboration with the University of Hull, examining the role of nuclear imaging in the assessment of cardiac mitochondrial function in type 4 cardiorenal syndrome.

My wife is a Care of the Elderly registrar who also has an interest in heart failure. Disappointingly, our 1-year-old daughter, Ramipril, has yet to share our enthusiasm for the speciality, but we are confident that she will be inspired when she receives her very own copy of The Oxford Textbook of Heart Failure on Christmas morning.

Dr Jane Cannon
Jane Cannon is a cardiology registrar in the West of Scotland who is currently out of programme undertaking a clinical PhD looking at the association between heart failure and cognitive impairment. She graduated from the University of Glasgow in 2005 with an MB ChB before entering clinical specialty training in cardiology. She was named as the inaugural BSH Research Fellow at the 2013 Autumn Annual Autumn Meeting. Upon completion of her PhD she plans to resume her clinical cardiology training with a specialist interest in heart failure.

Dr Callum Chapman
Dr Callum Chapman gained a medical degree from the Royal Free Hospital (University of London) in 1987 and undertook postgraduate training in General Internal Medicine & Geriatrics in the Northwest Thames region. He was appointed a Consultant Physician in General Internal Medicine (GIM) and Geriatrics at the West Middlesex University Hospital in 2002 and developed his sub-speciality interest in heart failure becoming Clinical Lead for Community/Chronic Heart Failure Services in 2003. He has a particular interest in the management of older people with advanced heart failure and complex co-morbidity and has on-going involvement with research into the management of anaemia and iron deficiency in patients with heart failure.

He is an Honorary Senior Lecturer at Imperial College School of Medicine with a large undergraduate teaching commitment and also takes every opportunity to promote the cause of postgraduate education in heart failure for both primary and secondary care colleagues.

Professor Andrew Clark
Professor Andrew Clark is professor of clinical cardiology in the University of Hull. He was educated at Pembroke College, Cambridge, and trained in medicine at Westminster Medical School. He trained in heart failure at the National Heart and Lung Institute and Glasgow Western Infirmary. He has published widely on aspects of heart failure, and is co-editor of the Oxford Textbook of Heart Failure. His research interests are in exercise physiology, the possible role of oxygen therapy for heart failure and the natural history of heart failure. He is the current Chair of the BSH.

Dr Derek T Connelly
Derek Connelly is a Consultant Cardiologist with an interest in electrophysiology and devices at the West of Scotland Regional Heart & Lung Centre, Golden Jubilee National Hospital, Glasgow, and at Glasgow Royal Infirmary. He is an Honorary Associate Clinical Professor at the University of Glasgow.

He qualified in medicine at the University of Glasgow in 1984. After early training in medicine and cardiology in Glasgow, he moved to the Royal Brompton Hospital, London, in 1989 for a research post in cardiac electrophysiology. He then moved to the Cardiothoracic Centre, Liverpool, in 1992 as a senior registrar in cardiology. He was appointed senior lecturer and consultant cardiologist there in 1997, and moved back to a consultant cardiologist post in Glasgow in 2004.

His main interests are radiofrequency ablation for cardiac arrhythmias, particularly for atrial fibrillation, and device implantation, particularly biventricular devices (cardiac resynchronisation therapy). From 2005 to 2008 he was President of Heart Rhythm UK (now the British Heart Rhythm Society), and he was a trustee of the Arrhythmia Alliance since its foundation in 2004 until 2012.
Mr Paul Forsyth
Paul Forsyth started work as a specialist heart failure pharmacist in 2004. During the past 10 years he has predominantly supported chronic heart failure patients in primary care. He runs a weekly general practice-based heart failure clinic, a weekly secondary care-based clinic for post-MI patients with left ventricular systolic dysfunction and he co-ordinates a service to support patients with suboptimal medication adherence. His clinical and research interests include the identification of suboptimally treated heart failure patients in primary care, the accuracy and completeness of general practice heart failure disease registers and medication adherence in heart failure.

Paul has previously presented at the British Cardiovascular Society in 2005 and was part of a research team that presented research at late-breaking sessions at the American Heart Association Scientific Sessions in 2011. He is an honorary lecturer in clinical pharmacy at Strathclyde University and annually guest lectures at the heart failure liaison nurse training course at Glasgow Caledonian University. He currently, along with a few key collaborators, holds three separate research and development funds for pharmacy interventions in heart failure. He is also currently completing a Masters project at Glasgow University on the primary care burden and costs of heart failure.

Professor Ahmet Fuat
Professor Ahmet Fuat has been in general practice in Darlington since 1986. As well as being a GP postgraduate GP tutor and PCT cardiologist lead, he also works as a GP specialist in cardiology and for 14 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 was recently awarded an honorary chair in Primary Care Cardiology from Durham University School of Health, Medicine and Pharmacy. Professor Fuat sits on the editorial boards of both the BJC and PCCJ. He is a tutor on the Bradford postgraduate diploma in cardiology course and chairs and lectures in cardiology nationally. He has served on the NICE and ESC guideline development groups on heart failure and myocardial infarction respectively. Professor Fuat is acting chair of the CVGP (Society for health professionals with an interest in cardiovascular medicine in general practice) CIC.

Dr Peter Cowburn
Dr Peter Cowburn is a Consultant Cardiologist with a specialist interest in heart failure at University Hospital Southampton. His MD thesis was undertaken in Glasgow, studying the haemodynamic effects of endothelin and endothelin receptor antagonists in patients with chronic heart failure (CHF). Following SpR 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 case series of inotrope-supported CRT and has an interest in the haemodynamic and renal effects of CRT. He was Deputy Chair of the BSH in 2007–9, having served as a Councillor to the Board in 2005–7. He represented the BSH as a clinical expert for the NICE CRT appraisal process in 2006–7.

At Southampton General, he helped establish a novel nurse-led inpatient heart failure service, which has led to a dramatic reduction in inpatient mortality. He has also helped set up an inpatient ultrafiltration programme, the first in the UK. He was a member of the working group who published guidelines for the referral and assessment of adults for cardiac transplantation (Heart 2011). He was one of the document reviewers for the ESC guidelines for the diagnosis and treatment of acute and chronic heart failure 2012.

Dr Jonathan Dalzell
Jonathan Dalzell is a final year cardiology specialty registrar in the West of Scotland deanery. He graduated from the University of Aberdeen in 2003 after which he undertook general professional training in Grampian University Hospitals and gained MRCP(UK) in 2006. He then completed an MD with Professor John McMurray’s heart failure research group at the University of Glasgow prior to taking up his registrar post. He is a subspecialty trainee in heart failure and device therapy and is currently undertaking a senior fellowship in advanced heart failure at Harefield Hospital in London.

Dr Ceri Davies
Dr Ceri Davies has been a Consultant Cardiologist and General Physician at Barts Health NHS Trust since 2005. After a period of research into heart failure at the Royal Brompton Hospital, his clinical training took place in NE London and Cambridge. His specialist interests are the management of heart failure and advanced non-invasive cardiac imaging (cardiac computed tomography and cardiac magnetic resonance imaging). He retains an interest in general cardiology and continues to take part in the general medical on-take rota at the Royal London Hospital. He has been an Observer to the BSH Board since 2013.

Mr Connor Emdin
Connor completed his undergraduate degree at the University of Toronto in biochemistry, and started his research career in basic science research. However, he had the chance to work on public health research at the end of his undergraduate in South Africa and switched to epidemiology. As a graduate student and Rhodes scholar at the University of Oxford, he is completing a DPhil in cardiovascular epidemiology with a focus on elevated blood pressure and heart failure. Following completion of his DPhil, he will be attending Harvard Medical School to train as a physician-researcher. He hopes to have a career in cardiology and cardiovascular epidemiology research.

Mr Paul Forsyth
Paul Forsyth started work as a specialist heart failure pharmacist in 2004. During the past 10 years he has predominantly supported chronic heart failure patients in primary care. He runs a weekly general practice-based heart failure clinic, a weekly secondary care-based clinic for post-MI patients with left ventricular systolic dysfunction and he co-ordinates a service to support patients with suboptimal medication adherence. His clinical and research interests include the identification of suboptimally treated heart failure patients in primary care, the accuracy and completeness of general practice heart failure disease registers and medication adherence in heart failure.

Paul has previously presented at the British Cardiovascular Society in 2005 and was part of a research team that presented research at late-breaking sessions at the American Heart Association Scientific Sessions in 2011. He is an honorary lecturer in clinical pharmacy at Strathclyde University and annually guest lectures at the heart failure liaison nurse training course at Glasgow Caledonian University. He currently, along with a few key collaborators, holds three separate research and development funds for pharmacy interventions in heart failure. He is also currently completing a Masters project at Glasgow University on the primary care burden and costs of heart failure.

Professor Ahmet Fuat
Professor Ahmet Fuat has been in general practice in Darlington since 1986. As well as being a GP postgraduate GP tutor and PCT cardiologist lead, he also works as a GP specialist in cardiology and for 14 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 was recently awarded an honorary chair in Primary Care Cardiology from Durham University School of Health, Medicine and Pharmacy. Professor Fuat sits on the editorial boards of both the BJC and PCCJ. He is a tutor on the Bradford postgraduate diploma in cardiology course and chairs and lectures in cardiology nationally. He has served on the NICE and ESC guideline development groups on heart failure and myocardial infarction respectively. Professor Fuat is acting chair of the CVGP (Society for health professionals with an interest in cardiovascular medicine in general practice) CIC.

Dr Roy Gardner
• Specialist interest in advanced heart failure, cardiac transplantation, mechanical circulatory support, and complex devices.
• Honorary Senior Clinical Lecturer, University of Glasgow.
• Author/Editor: Oxford Specialist Handbook of Heart Failure and Oxford Textbook of Heart Failure.
• Active research profile in heart failure and complex devices.
• On the ESC curriculum committee for advanced heart failure.
• Councillor on the Board of the BSH.
**Dr Arjun K Ghosh**
Dr Arjun K Ghosh is a Specialty Registrar in Cardiology, NHS London and Honorary Research Fellow at the International Centre for Circulatory Health, National Heart and Lung Institute. He completed his MBBS from Calcutta University in 2002 with a Gold Medal awarded in 2000. He undertook postgraduate training in General Medicine in Ayr and London completing the MRCP (UK) in 2006. He commenced specialist registrar training in cardiology on the NW London rotation in 2007.

He has a special interest in medical education and was awarded an MSc in Medical Education with distinction, graduating first in his year from University College London and the Royal College of Physicians in 2010. He was also awarded Fellowship of the Higher Education Academy in 2008.

He undertook research looking at life course determinants of cardiac structure and function in the longest running birth cohort study in the UK (the Medical Research Council National Survey of Health and Development). Following up over 5000 men and women born in 1946, Arjun and colleagues have shown that blood pressure and body mass index in earlier life are associated with cardiac structure and function many years down the line at age 60–64 years. His research has won numerous awards internationally, nationally and at Imperial, and he was awarded his PhD in 2013. His work has also generated high-impact publications. Current research interests include following up the 1946 British birth cohort from a cardiovascular viewpoint. He is based at Imperial College Healthcare NHS Trust for his clinical duties and is subspecializing in heart failure and imaging.

**Dr Suzanna Hardman**
Dr Suzanna Hardman is a Consultant Cardiologist with an Interest in Community Cardiology at Whittington Health, London, a newly integrated care organisation, where she leads the Heart Failure Services and related research, and is an Honorary Senior Lecturer at University College London. Dr Hardman has represented the BSH in various contexts in the UK and Europe. A longstanding member of the BSH, she is currently a Board Member as immediate Past-Chair of the Society. She has been involved with advanced training in HF from curriculum development to implementation across London and other HF training programmes, and current training review. She advises the London Specialist Training Committee and RSM on HF. She continues to work with the BCS, HFA, & others on a wide range of HF issues. She represents the BSH at the National HF Audit, an initiative she is heavily involved with, and is committed to using the data to drive the delivery of higher quality HF care and a better understanding of the condition. She is currently leading work on UK heart failure standards for the BSH.

Dr Hardman was a member of the NICE Guideline Development Group for the Chronic Heart Failure Guideline Update (2010), the related Quality Standards (2011), and a member of the Acute Heart Failure GDG for these recently published NICE guidelines (2014).

**Dr Paul Kalra**
Dr Paul Kalra is a Consultant Cardiologist and Heart Failure Lead at Portsmouth Hospitals NHS Trust, with his role including the implantation of implantable cardioverter defibrillator and cardiac resynchronisation therapy devices. He is current Deputy Chair of the BSH. He is interested in medical education and research, and has in excess of 75 peer-reviewed publications. He also has a clinical and academic interest in patients with cardio-renal disease. He was co-organiser of the UK’s first national Cardio-Renal Conference in 2006; this has now developed into a very successful annual meeting (now in its 9th year). He was co-programme director of the BSH Annual Autumn Meeting in November 2010 and 2013. He has ongoing responsibilities for the British Cardiovascular Society (member of the Knowledge Based Assessment Board & Standard Setting Group) and the ESC (member of the MCQ question setting and review group).

**Professor Philip Kalra**
Professor Philip Kalra graduated from Cambridge University and is Consultant Nephrologist at Salford Royal NHS Foundation Trust, Honorary Professor at the University of Manchester. He is lead of the renal research team at Salford and has major research focus on atherosclerotic renovascular disease and cardiovascular disease in chronic kidney disease, as well as having research interests in iron deficiency in renal populations. He is national chair of the NIHR Renal Disorders group of the clinical trials network. He has been involved in the development of several large UK clinical trials in nephrology and cardiology and has played a role in amalgamating Cardio-Renal education and research within the UK. He has been involved in postgraduate nephrology education for over two decades and is editor of a popular textbook used in preparing for the MRCP.

**Dr Ninian N Lang**
Dr Lang was recently appointed as Consultant Cardiologist at the Western Infirmary, Glasgow. He is an Honorary Senior Lecturer at the University of Glasgow. His primary clinical interests are in heart failure and cardiac devices. Previously, he completed an 18-month fellowship in advanced heart failure and cardiac devices at the Scottish Advanced Heart Failure Service. Prior to this, his clinical training was in Edinburgh. Following the award of his doctoral thesis he was employed as Clinical Lecturer in Cardiology at the University of Edinburgh. He maintains an active translational cardiovascular research interest. The focus of this has primarily been in endothelial biology, pharmacology and in the application of novel imaging techniques using magnetic resonance imaging and echocardiography.
Professor Christian Latrémuille
Professor Christian Latrémuille is a cardiac surgeon working in the Department of Cardiovascular Surgery at the Georges Pompidou European Hospital in Paris, France. He trained in the team of Professor Carpentier in Broussais Hospital where he has been a member of the staff since 1993. He is also Professor in Cardiac Surgery and Anatomy at the Paris Vth University René Descartes.

Over a period of more than 15 years, his fundamental research, conducted in immunology and more specifically in xenotransplantation, led to the responsibility of taking charge of the cardiac transplant programme, first in Broussais Hospital, then in the Georges Pompidou European Hospital.

This natural history research led to work in the field of heart failure and to the integration of the development programme of a new generation of bioprosthetic total artificial heart (TAH), which became the Carmat TAH. For more than 10 years he has collaborated with the company’s engineer teams. He has conducted animal studies involving more than 35 implantations. These permitted the obtaining, from the French Regulatory Affairs Department, of authorisation to perform the first implantation in man, which occurred in December 2013, followed by a second implantation last August.

Mrs Annie MacCallum
I am the Head of Specialist Services at Gloucestershire Care Services NHS Trust. A heart failure specialist nurse with experience in acute hospital and community heart failure care, I am responsible for a countywide multidisciplinary Heart Failure Service providing community echo, GPSI clinics and heart failure specialist nurse follow up for patients at all stages in their disease. I am a champion for the role of the specialist nurse in my own organisation, defining the academic requirements, the skills, decision making and participation in audit to demonstrate the effectiveness of specialist nurses in improving outcomes for patients in providing comprehensive evidence based care. As a keen supporter of specialist nurse education, I have helped develop the programmes for the annual BSH Heart Failure Nurse Study Days. I am an Observer to the Board of the BSH and an Affiliate Board Member of the British Association for Cardiac Prevention and Rehabilitation.

Professor Theresa McDonagh
Theresa McDonagh is a Consultant Cardiologist and Clinical Lead for Heart Failure at King’s College Hospital, London. After completing her medical education at the University of Edinburgh Medical School in 1987, Professor McDonagh was appointed Research Fellow in Cardiology at the Western Infirmary, Glasgow, in 1991, and the Lecturer at the CRI in Heart Failure at the University of Glasgow (Honorary Senior Registrar), in 1994. In 1999, she was appointed a Senior Lecturer (Honorary Consultant Cardiologist) at the University of Glasgow and Glasgow Royal Infirmary, running the Heart Failure Service, and the cardiologist involved in the Heart Transplant Programme. She then spent 7 years as a Consultant Cardiologist with an interest in Heart Failure at the Royal Brompton Hospital, London, before taking on her current role.

Her research interests are in clinical heart failure, in particular the epidemiology of heart failure and left ventricular dysfunction, and the role of biomarkers in both the diagnosis and prognosis of heart failure, and in the delivery of heart failure care. She is also the Clinical Lead for the National Heart Failure Audit.

Mr Steve McGlynn
I qualified as a pharmacist in 1983 and initially worked in Edinburgh where I also obtained my MSc. I subsequently held more senior clinical posts at the University Hospital of South Manchester and at Hope Hospital in Salford. I moved back to Glasgow in 1994 and have held management, R&D and specialist clinical posts since then.

I have worked in cardiology for over 20 years and have a particular interest in the delivery of evidence-based care to patients with heart disease and the expansion of the role of pharmacists working within the multi-disciplinary cardiology team. I have also been involved in developing national guidelines for SIGN, national educational material for NHS Education Scotland, and local and national healthcare strategy in cardiology. I’m also involved in local, regional and national working groups focusing on prescribing in cardiovascular medicine.

I qualified as a pharmacist supplementary prescriber in 2004 and as an independent prescriber in 2008. I hold an Honorary Senior Teaching Fellow position at the University of Strathclyde and also teach on courses at Glasgow and Glasgow Caledonian Universities.

I currently practice as a clinical pharmacist on a large cardiology unit and a heart failure out-patient clinic.

Professor John McMurray
John McMurray is Professor of Medical Cardiology in the Institute of Cardiovascular and Medical Sciences at the University of Glasgow, UK and Lead Consultant Cardiologist at the Western Infirmary, Glasgow. He served as the inaugural Eugene Braunwald Scholar in Cardiovascular (CV) Disease at the Brigham and Women’s Hospital, Boston, USA, and visiting Professor of Medicine, Harvard University, Boston, in 2010/2011. He is also Past-President of the Heart Failure Association of the European Society of Cardiology (ESC).

Professor McMurray’s primary research interest is in heart failure (HF) and his main research activity is clinical trials. He is, or was, the principal investigator, and member of the executive committee or steering committee in a number of large trials in HF, other CV diseases, renal disease and diabetes. He chairs the event adjudication group at Glasgow University, which has served as the endpoint committee for many trials. He has also participated in many data monitoring/ safety committees.

Professor McMurray sits on the editorial board of the New England Journal of Medicine, as well as several leading CV journals, including the European Heart Journal and European Journal of Heart Failure. He has published approximately 600 original papers, reviews, and book chapters and is the primary author or editor of 13 books and was the lead author of the World Health Organization and first Scottish Intercollegiate Guidelines Network Guidelines on the Management of HF. In addition he was a member of the 2008 ESC HF Guidelines Task Force, and Chair of the 2012 Task Force and member of the 2013 American College of Cardiology/American Heart Association HF Guidelines Committee. He is a member of the National Institute for Health and Care Excellence (NICE) Acute HF Guidelines Committee and was recently appointed to NICE (Appraisal Committee A). Professor McMurray was recently included in the new 2014 listing of Highly Cited Researchers by Thomson-Reuters.
Dr Angus Nightingale

Dr Angus Nightingale is a Consultant Cardiologist at the Bristol Heart Institute where he leads the Heart Failure Team. He runs an advanced heart failure clinic and community diagnostic clinics and works closely with the Heart Failure Specialist Nurses (the key ingredient for excellent heart failure care). He trained in Cambridge, London, Plymouth and Bristol before doing research in Cardiff and Oxford with Professor Frenneaux looking at the role of endothelial function in muscle metabolism (discovering that high-dose vitamin C did not improve fatigue and breathlessness in heart failure patients). After completing his cardiology training in 2003 he left the UK for a Consultant post in Adelaide, Australia, where he set up a stress echo service and continued research in heart failure and aortic valve disease. He hurriedly came back to Bristol when his children starting wanted to play cricket for Australia! He splits his time between clinical work and research into autonomic dysfunction. He is involved in research in hypertension and heart failure, looking at novel ways to reduce sympathetic activation and augment vagal reflexes. He is currently running trials looking at modulating the chemoreflex (carotid body), vagal nerve stimulation, renal denervation and deep brain stimulation.

Dr Pierpaolo Pellicori

I am a young cardiologist currently working as a clinical research fellow in heart failure at the Academic Department of Cardiology at Hull York Medical School, where I have been supervised by Professor John Cleland and Professor Andrew Clark.

During the past four years spent in Hull, I have combined both research and clinical duties. I have helped with the local organisation and conduct of a large multi-centre epidemiological research project in heart failure funded by an FP7 grant (SICA-HF) and I have also produced a substantial body of personal research which has been published in high impact, peer-reviewed journals. I have also been recognised by the European Society of Cardiology and the American College of Cardiology for the standard of my research and I was awarded as the Young Investigators’ Award last year at the BSH meeting.

My main area of interest is novel imaging modalities in heart failure.

I am eager to pursue a career in academic clinical cardiology. Although I have finished my training and am eligible to apply for a consultant post in the UK, I feel it important to continue with my period of research at present to maximise my potential and I am grateful to all my colleagues (and family) who have supported my activities since arriving in the UK.

Dr Divaka Perera

Divaka Perera is the Chief Investigator of REVIVED. He is an academic interventional cardiologist and so plays a dual role – a researcher by day (as a Reader in Cardiology at King’s College London) and an interventional cardiologist at night (at Guy’s and St Thomas’ Hospital) … and vice versa, depending on grant deadlines and PAMI calls! The theme of his research is myocardial ischaemia in the context of coronary artery disease and valvular heart disease, and he hopes to translate the insights gained from detailed physiological assessment of the heart to clinical treatments that are evaluated using carefully designed, multicentre clinical trials. REVIVED is a trial which is supported by the BSH (several recent and current BSH office bearers helped to design the trial and sit on the steering/data monitoring committees) as well as the British Cardiovascular Intervention Society (who have officially adopted the trial, which is also known as BCIS-2). Successfully delivery of the trial depends on close collaboration between heart failure and intervention specialists in the recruiting centres.

Dr Mark Petrie

Mark Petrie is a Consultant Cardiologist in Glasgow. He sees patients in two weekly heart failure clinics and manages patients with severe, acute heart failure in a heart failure unit. He also has an interest in cardiac and coronary intervention. Mark is the Chair of the Scottish Heart Failure Hub (a subgroup of the National Advisory Committee in Scotland (UK)).

Dr Stephen Pettit

Dr Stephen Pettit studied medicine at the University of Newcastle upon Tyne. He trained in Cardiology in Glasgow, Liverpool and Cambridge. He was recently appointed as a Consultant Cardiologist at Papworth Hospital. He is involved in the assessment of patients with advanced heart failure for transplantation and mechanical circulatory support, and in the care of these patients after surgery. In addition, he is involved with implantation, optimisation and follow-up of patients with complex pacemakers and defibrillators. He is interested in communicating clearly and honestly with patients, carers and colleagues. He is also interested in escaping hospital to spend time rock climbing, mountaineering and mountain biking.
**Dr John Sharp**

John completed both his undergraduate Psychology degree and Doctorate in Clinical Psychology at the University of Glasgow where he is an honorary research fellow following some not-especially-noteworthy forays into academia and clinical teaching. He has worked as a clinical psychologist within cardiac settings since qualifying in 2004. He is a consultant clinical psychologist within the Scottish National Advanced Heart Failure Service at the Golden Jubilee National Hospital. He can do 200 press-ups in one minute and wrestle sharks and alligators simultaneously whilst blindfolded. He struggles to take writing profiles about himself seriously.

**Dr Anita Simonds**

Anita Simonds is a Consultant in Respiratory and Sleep Medicine at Royal Brompton Hospital, London, and Professor of Respiratory and Sleep Medicine at the National Heart & Lung Institute, Imperial College London, with a research and clinical interest in sleep disorders, acute and chronic respiratory failure in adults and children, and neuromuscular disease. She has investigated the physiological basis of breathing difficulties during sleep, carried out trials of ventilatory support in a range of conditions including chronic heart failure, and set up the Royal Brompton Centre for Sleep.

**Dr Joanne Simpson**

Dr Joanne Simpson completed her general medical training in Glasgow, before completing a one year fellowship with the Scottish National Advanced Heart Failure Service at the Golden Jubilee National Hospital in Clydebank, Glasgow. She is currently a clinical research fellow at the University of Glasgow and is undertaking a PhD investigating the aetiology of dilated cardiomyopathy.

**Professor Iain Squire**

Professor Iain Squire qualified from Glasgow University in 1987. He trained first at Glasgow, where he held the position of Lecturer, and then at the University of Leicester, where he was initially Lecturer then Senior Lecturer in Medicine & Therapeutics. He was awarded a personal Chair in April 2009, and is also Honorary Consultant Physician at the University Hospitals of Leicester NHS Trust. Professor Squire has responsibility for the 19-bed coronary care unit at Glenfield Hospital, Leicester, and is one of three consultants running the outpatient heart failure service there. He is Vice Chair of the NICE Technology Appraisals Committee A. Professor Squire has held the positions of Councillor, Treasurer and Deputy Chair on the Board of the BSH, and is currently Chair-Elect.

**Dr Colin G Stirrat**

Dr Colin Stirrat is a Clinical Research Fellow at the BHF Centre for Cardiovascular Science at the University of Edinburgh. He received his MBCHB and BSc Med Sci (Hons) from the University of Aberdeen in 2006. He has held a National Training Number in Cardiology in South-East Scotland since 2010.

His academic interests centre on novel therapies in the treatment of heart failure and he has recently published in the field of molecular imaging using ultrasmall superparamagnetic particles of iron-oxide (USPIO) enhanced cardiac MRI. He can be contacted at colin.stirrat@ed.ac.uk.
Dr Lorna Swan
Following training in Glasgow and Toronto I was appointed as a Consultant Cardiologist in Adult Congenital Heart Disease at the Royal Brompton & Harefield Hospitals in 2006. The Royal Brompton Hospital has one of the oldest and largest adult congenital heart disease (ACHD) services in the world and offers all of the supra-specialist services these patients require. I have been the Clinical Lead of the service for 6 years. As well as all aspects of adult congenital cardiac care my specific remit includes the Pregnancy & Heart Disease service and the advanced ACHD heart failure programme.

I am currently a council member on the BCCA and in the nucleus group of the ESC GUCH working group.

Dr Jackie Taylor
After studying medicine at Glasgow University, Jackie Taylor trained and accredited 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, is a Consultant in Medicine for the Elderly at Glasgow Royal Infirmary and was previously Associate Medical Director for the specialty for NHS Greater Glasgow and Clyde (GGC). Dr Taylor chairs the Heart Failure Sub-Group of the Cardiac Managed Clinical Network for GGC and is responsible for developing and delivering the Heart Failure Strategy. She is an Observer to the Board of the BSH and Secretary of the Cardiovascular Division of the British Geriatrics Society. From a clinical perspective, Dr Taylor’s main interest is the development of comprehensive multi-professional 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 Lindsey Tilling
I am a final year cardiology specialist registrar with an interest in heart failure and devices. Following my PhD in endothelial dysfunction at St Thomas’ hospital I completed the north Thames heart failure fellowship rotation, and have recently commenced a devices fellowship at Harefield Hospital.

Dr Niki Walker
Dr Niki Walker is a Consultant Cardiologist in the Scottish Adult Congenital Cardiac Service based in Clydebank. Her subspecialty interest is transcatheter intervention. She has an ongoing interest in the management of heart failure in patients with congenital heart disease.

Dr Simon Williams
Simon Williams is the clinical lead for heart failure at Wythenshawe Hospital, Manchester. He specialises in all aspects of heart failure: community services, in patient multi-disciplinary work, cardiac transplant and ventricular assist device assessment, and complex pacing. Dr Williams is also an honorary senior lecturer at the University of Manchester, where he and his mates write the odd article in cardiology magazines. He is the Treasurer of the BSH and will be presenting the accounts on the Friday morning of the annual meeting with a hangover.
EXHIBITORS AND CONTRIBUTORS

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Abbott has more than 20 programs in development in the areas of coronary artery disease, endovascular disease and mitral regurgitation, and we are working on well-staged advances and innovative technologies that have the potential to change the way physicians treat vascular disease.

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BioControl Medical develops the CardioFit system, a unique, implantable vagus nerve stimulation system, which includes a pacemaker-like stimulator placed in the upper chest and a proprietary nerve stimulation cuff placed on the right vagus nerve in the neck. The CardioFit is currently being tested in a 650 patients’ INOVATE-HF (INcrease Of VAgal TonE in Heart Failure) trial. The primary endpoint of the study is a comparison between the number of HF hospitalizations and all-cause mortality in patients with CardioFit vs. those on standard evidence-based management. With more than 65 participating centers globally (10 of which in the UK), INOVATE-HF is the largest prospective, randomized global study ever to evaluate the treatment of HF with vagus nerve stimulation. The initial safety and performance of the CardioFit were demonstrated in a 32-patient, multi-center, pilot clinical study conducted in Germany, Italy, The Netherlands and Serbia. Study data showed that patients experienced sustained significant improvement across key clinical measures including left ventricular function and structure, heart rate variability, and resting heart rate. Patients also showed improvement in self-reported quality of life surveys and six-minute walk tests.

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For over 50 years the British Heart Foundation has pioneered research that’s transformed the lives of people living with heart and circulatory conditions. Our work is central to the discovery of vital treatments, improvement of patient services, and communicating vital health information to help the UK fight for every heartbeat.

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The British Heart Foundation 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 over 1,000 members and six companies that are Friends of the BSH. The BSH Board consists of the following members: Professor Andrew Clark (Chair), Dr Suzanna Hardman (Past-Chair), Professor Iain Squire (Chair-Elect), Dr Paul Kaia (Deputy-Chair), Dr Simon Williams (Treasurer), Dr Roy Gardner, Mrs Jayne Masters and Professor John McMurray as Councillors. The Observers to the Board are as follows: Mrs Amanda Crundall-Goode, Dr Ceri Davies, Mrs Annie MacCallum, Dr Jim Moore, Dr Jackie Taylor and Dr Lindsey Tilling.

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Website: www.bsh.org.uk
Twitter: #BSHeartFailure

The Cardiomyopathy Association (CMA) is a UK charity that provides information and support to families affected by cardiomyopathy. People diagnosed with cardiomyopathy are often faced with a bewildering search for answers to the many questions that arise. The CMA has developed authoritative information resources to help patients and their families to understand the various forms of cardiomyopathy. Information booklets are provided free of charge to individuals and hospitals.

The charity provides a ‘helpline’ service, which allows people to discuss their concerns with a qualified nurse.

The charity’s website, www.cardiomyopathy.org, is a highly used resource containing a wealth of information about living with cardiomyopathy.

The CMA organises information days around the UK for people affected by cardiomyopathy. These meetings provide the opportunity to learn more about the conditions and meet others similarly affected.

The CMA works to improve health professionals’ knowledge of cardiomyopathy by organising high profile national conferences for doctors, nurses and associated professions to provide education on latest updates in the diagnosis, treatment and management of cardiomyopathy.

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Medtronic is the global leader in medical technology – alleviating pain, restoring health, and extending life for millions of people around the world. We’re creating technologies that treat chronic disease in new ways so people can live better, longer. We provide technologies to change lives.

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PHARMA NORD
Pharma Nord is one of Europe’s leading manufacturers of dietary supplements and natural preventative medicines. The company develops, manufactures, and markets its range with emphasis on bio-availability, safety and documentation.

In October 2014, the results of an international heart study were published in the Journal of the American College of Cardiology. The results showed that daily supplementation with Myoquinone (Co-enzyme Q10) improves survival in patients with chronic heart failure and works in conjunction with conventional treatments. In actual fact, the reduction in all-cause mortality in chronic heart failure patients was by more than 40%. Pharma Nord supplied the Myoquinone capsules during the 5 year study and Prof. Svend Mortensen, Chief Cardiologist from Copenhagen University Hospital said, “I definitely think that the results we have seen are extremely positive. We are looking at a shift of paradigm in the treatment of chronic heart failure”.

Pharma Nord preparations have been studied in over 200 clinical trials and are based on a substantial research database. They are used by hospitals, pharmacies, health food shops, practitioners and consumers. In terms of absorption, safety and efficacy, Pharma Nord products represent standards that most other brands cannot begin to meet.

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THE PUMPING MARVELLOUS FOUNDATION
The Pumping Marvellous Foundation is the UK’s patient led heart failure charity. Founded by a heart failure patient whose experiences have shaped the foundation’s goals and principles of a patient-centric charity focused on improving patient outcomes.

The Foundation’s goal is to deliver HOPE to heart failure sufferers and their families through the facilitation of better outcomes by cross-working and advocating at a local, regional, national and international level; working hand in hand with the health economy to deliver better care and be the patient voice of progression. All services are patient driven, created and delivered by patients. The foundations knowledge and value comes from the beneficiaries and is a valuable resource to health economies, attracting international exposure. All its information output, driven through its publications, is crowd sourced from social media gateways. We improve the ability of heart failure patients to self-care, recognising symptoms early allowing them to apply self-interventions and steps that can alleviate common symptoms.

The Foundation is funded through donations and fundraising by individuals, support from the NHS and charitable organisations together with corporate sponsorship.

The founder and CEO Nick Hartshorne-Evans is also the President of the recently formed iHHub, The Global Heart Failure Patient Alliance.

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RESMED (UK) LTD
ResMed is a leading developer and provider of technology for the identification, diagnosis and treatment of sleep disordered breathing and respiratory insufficiency in different patient populations. Current guidelines are in place for the treatment of primarily obstructive sleep apnoea in heart failure. Since 2008 ResMed has sponsored the Serve-HF international randomised controlled trial in heart failure. It evaluates the impact of PaceWave™, an adaptive servo ventilation technology, in treating central sleep disordered breathing in a stable heart failure population with reduced ejection fraction. Its primary end points are mortality and morbidity. With an estimated 30-50 percent of heart failure patients potentially at risk from this condition, the results from SERVE-HF may have important consequences for the future management of these patients. Recruitment is now closed (1325 patients) and study completion is anticipated by mid-2015 and results are expected to be available in the first half of 2016.

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SERVIER LABORATORIES LTD
Servier Laboratories is the UK subsidiary of The Servier Research Group, a French research based pharmaceutical company established in 1954 by Dr Jacques Servier. Created in 1963 with only two people, the UK subsidiary was the first subsidiary outside France. In just over fifty years, The Servier Research Group has developed in stature from a small family-owned, provincial pharmacy employing nine people to a multi-national operation, established in 140 countries and with over 20,000 employees worldwide.
Servier is now an independent foundation. Unlike many other pharmaceutical companies Servier is not registered on any stock market and therefore is not beholden to shareholders.
Servier is dedicated to the development of truly innovative drugs and reinvesting as much as 25% of turnover in Research & Development.

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SUNSHINE HEART
The C-Pulse® Heart Assist System is a balloon counterpulsation technology used to treat patients with moderate to severe heart failure (Class III/Ambulatory Class IV). The implantable device is placed outside the bloodstream and gives patients the ability to disconnect from the system. Preliminary results of the C-Pulse System have indicated relief of heart failure symptoms, improved quality of life and cardiac function, and reduced the need for heart failure hospitalisation. The C-Pulse implant procedure can be performed minimally invasively. The European Post-Market Study (OPTIONS HF) and the US Investigational Pivotal Trial (COUNTR HF™) are currently underway.

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WISEPRESS MEDICAL BOOKSHOP
Wisepress are Europe’s principal conference bookseller. We exhibit the leading books, sample journals and digital content relevant to this meeting. Books may be purchased at the booth, and we offer a postal service. Visit our online bookshop for special offers and follow us on Twitter for the latest news @WisepressBooks.

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Advance notice

For more information about the events below please visit the BSH desks in the exhibition area or www.bsh.org.uk

Parliamentary Event, Acute Heart Failure Guidelines

An event will be held at the Houses of Parliament in conjunction with the British Heart Foundation to raise awareness of the NICE acute heart failure guidelines.

7th BSH Heart Failure Day for Revalidation and Training
5 March 2015, Charterhouse Square, London

This training day programme has been designed by Dr Ceri Davies, Dr Paul Kalra and Dr Lindsey Tilling to meet the educational needs of the heart failure component of the core curriculum in cardiovascular medicine, as well as the needs for advanced training in heart failure. It will provide an in-depth discussion around particularly challenging and often controversial management issues that will be relevant to trainees in internal medicine, care of the elderly specialists and GPs with a special interest in heart failure.

5th BSH Heart Failure Nurse Study Day
6 March 2015, Charterhouse Square, London

The study day programme has been designed by Mrs Jayne Masters and Mrs Annie MacCallum. The day aims to provide evidence-based knowledge from leading UK specialists in heart failure management, and in-depth discussion of particularly challenging and controversial management issues facing nurses caring for patients with heart failure. It is designed to educate and interest heart failure nurses and will be of interest to nurses, both early in their role and those with more experience.

European Heart Failure Awareness Day
8 May 2015

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

British Cardiovascular Society Annual Conference
8–10 June 2015, Manchester Central, Manchester

The BSH will be involved with a number of heart failure-related sessions at this conference.

18th BSH Annual Autumn Meeting 2015
26–27 November 2015, Queen Elizabeth II Conference Centre, London
Queen Elizabeth II Conference Centre, London
Benjamin Britten Lounge

17th BSH Annual Autumn Meeting, 27–28 November 2014
Exhibition Plan

Catering area

Healthcare professionals and company staff only are allowed inside the exhibition area outlined with a dotted line.