Abstract 008 Table 1

	HFNEF with LVH	HFNEF without LVH	Controls	p-value (ANOVA)
SD systolic motions (ms) at Rest	53.3±32.7	45.5±33.2	44.8±25.7	0.456
SD systolic motions (ms) on exercise	48.0±28.3* †	28.7±18.7	25.7±15.7	<0.001

*p<0.05 compared to controls.
†p<0.05 compared to HFNEF patients without LVH.

009 UNCOVERING THE MECHANISM OF THE PARADOXICAL ASSOCIATION BETWEEN CARDIAC DYSSYNCHRONY AND BETTER SURVIVAL IN HEART FAILURE

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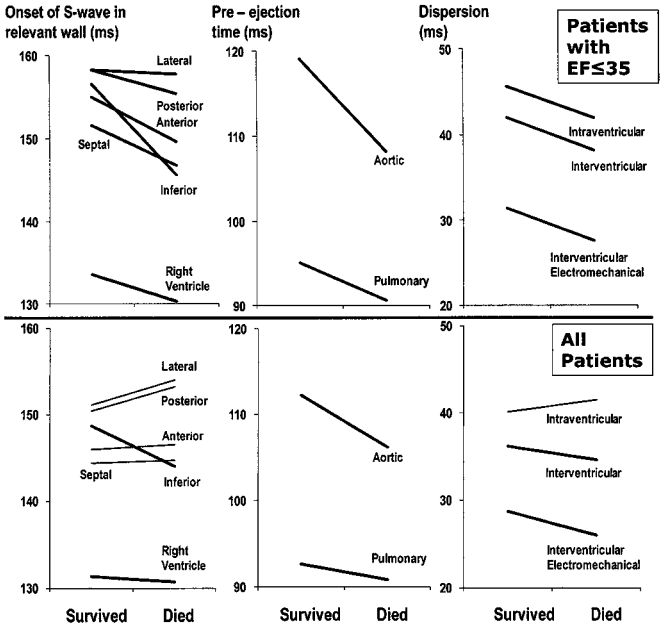
Introduction Paradoxically, dyssynchrony before CRT is associated with a better prognosis. We tested whether this was dependent on device implantation or on how the cohort was defined (EF ≤35 vs All-comers).
Methods 419 patients (67.8±11.3 years, 79.2% males, 127 deaths) with heart failure had echocardiographic assessment of mechanical dyssynchrony and were followed up (median 3.1 years).
Results 135 had dyssynchrony and 62 received CRT. The mean EF was 33.1±15.0%; 157 (35.2%) had an EF >35%. Among patients with EF≤35% (n=249), shorter aortic pre-ejection time (ie, *less* dyssynchrony) was associated with a worse prognosis (p<0.05). All dyssynchrony markers were higher in survivors (p<0.001 by sign test, upper panel). EF was not prognostic and depressed by dyssynchrony (r=−0.4, p<0.001). By examining all patients (regardless of EF); the association between dyssynchrony and better survival disappeared (p>0.05, lower panel). EF was restored to its prognostic significance (p=0.02). Taking a different approach to define poor ventricular function—using low S-wave velocity—EF had prognostic significance (p<0.05) and dyssynchrony markers were non-prognostic (p>0.05).
Conclusion Dyssynchrony predicts better survival in low EF groups because dyssynchrony artifactually lowers EF without damaging survival. The effect is independent of CRT. Replacement of EF with dyssynchrony-neutral measures of LV function, for example, peak S-wave velocity would avoid the appearance that dyssynchrony is favourable.



Abstract 009 Figure 1

010 MULTICENTRE VALIDATION OF THE ADVERSE PROGNOSTIC IMPLICATIONS OF DECLINING SERUM ALBUMIN LEVELS IN CHRONIC HEART FAILURE

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Background Single-centre studies have shown that a low serum albumin at baseline forecasts enhanced mortality in chronic heart failure (CHF) possibly because it reflects aberrations (eg, inflammation, impaired nutrition, plasma volume expansion) that can exacerbate disease. We hypothesised that attenuations in serum albumin over time would be prognostically more ominous than baseline values, and would be so even in a multicentre setting.
Methods We analysed the survival implications of baseline albumin and Δalbumin in a derivation cohort of 246 CHF outpatients (mean [±SD] age 68±12 years, LVEF 29±8%, 48% NYHA class >2) from University College London Hospital and then in a validation cohort of 148 CHF outpatients (age 69±12 years, LVEF 28±10%, 41% NYHA class >2) from Imperial Healthcare (St Marys Hospital and Hammersmith Hospital, London).
Results In the derivation cohort, 51 (21%) patients died over 13 months. Baseline albumin independently predicted mortality (HR 0.89, 95% CI 0.84 to 0.94, χ^2:18, p<0.0001). However, Δalbumin (unadjusted HR 0.89, 95% CI 0.84 to 0.92, χ^2:53, p<0.0001) was even more predictive (Difference in ROC AUC for baseline vs Δalbumin 0.16, p<0.001) and did so independently of all covariates including baseline albumin. A reduction in albumin > 6 g/l optimally predicted death (ROC AUC 0.82, p<0.0001) and conferred a sixfold escalated risk of mortality (HR 6.42, 95% CI 3.67 to 11.22, p<0.0001). In incremental prognostic analyses, the addition of Δalbumin to the strongest four variable model (baseline albumin, NYHA class, Δurea, Δhaemoglobin) dramatically augmented the χ^2 value (43 vs 84, p<0.0001). In the validation cohort, 43 (30%) patients died. Δalbumin (unadjusted HR 0.89, 95% CI 0.86 to 0.92, χ^2: 44, p<0.0001) was again prognostically superior to baseline albumin with a fall >6 g/l predicting an ~sixfold increased risk (HR 5.64, 95% CI 3.08 to 10.31, χ^2: 35, p<0.0001). Addition of Δalbumin to the strongest three variable model (baseline red cell distribution width, Δred cell distribution width, Δurea) also augmented the χ^2 value (51 vs 65, p<0.001).
Conclusions A fall in serum albumin over time consistently predicts an amplified risk of death in systolic CHF and enables simple and cheap risk stratification.

011 HBA1C AND MORTALITY IN DIABETIC INDIVIDUALS WITH HEART FAILURE: AN OBSERVATIONAL COHORT STUDY

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Background Controversy exists regarding the importance of glycaemic control in patients with type 2 diabetes mellitus (T2DM) and chronic heart failure (CHF) based on conflicting reports that had used a single baseline HbA1c.

Objective To examine the relationship between the mean of all HbA1c measures after CHF diagnosis and outcome in a large cohort of T2DM patients with incident CHF.
Design Retrospective, observational cohort study.
Setting Tayside, Scotland.
Patients T2DM patients with incident CHF between 1993 and 2010.
Measurement A weighted mean HbA1c was calculated using all available HbA1c measures following CHF diagnosis and patients were grouped into five categories of HbA1c (≤6%, >6–≤7%, >7–≤8%, >8–≤9% and >9%). We subsequently compared diet and drug treated populations. The relationship between mean HbA1c and all-cause deaths after CHF diagnosis was assessed.
Results 795 patients with T2DM met study criteria. Median follow-up of 3.8 years saw 491 (61.8%) deaths. Cox regression model, adjusted for all other significant predictors, with the middle HbA1c category (>7–≤8%) as the reference, showed a U shaped relationship between HbA1c and outcome. (<6% [HR 95% CI 1.78 (1.26 to 2.52)]; >6–≤7% [1.29 (1.01 to 1.66)] and >9% [1.38 (1.03 to 1.84)]. We found a similar relationship in the drug treated sub-group. However in the diet only group, low HbA1c was associated with the lowest risk of death (≤7% [0.17 (0.07 to 0.39)]).
Conclusions In patients with T2DM and CHF, our observational study shows that in drug treated patients there was a U shaped relationship between HbA1c and mortality with the lowest mortality risk in patients with modest glycaemic control (HbA1c, >7–≤9%). However in diet treated patients, lower HbA1c was associated with lower mortality risk.

012 AUTOMATED DATA CAPTURE FROM ECHOCARDIOGRAPHY REPORTS TO ENHANCE HEART FAILURE POPULATION RESEARCH

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Background As IT dominates cardiology, the ability of centres to link clinical databases to perform outcome based research has increased significantly. Good quality research relies on the ability to accurately identify and characterise the disease of interest in the population. Heart Failure is one such disease that is often challenging to define from datasets. Uniquely we have the ability to link the Tayside echocardiography dataset to other regional datasets including dispensed prescription and hospitalisation data. Echocardiography reports are commonly comprised of structured, usually numerical values, and a free text component to store overall conclusions or impressions. We therefore sought to develop a computer algorithm to determine LV function from the free text and subsequently to validate the ability to define systolic HF based upon LVSD and loop diuretic therapy.
Methods We iteratively the algorithm to process the free text component the reports and determine the degree of impairment. The algorithm was comprised of a lexicon of words and phrases and applied with negation detection. This was repetitively enhanced by recurrent processing of a subset of the data. The final algorithm was subsequently applied to the full dataset and was validated, first, against blinded manual review of a subset of reports and second by blinded review of the stored images. The data were then linked using a unique patient identifier to the dispensed prescribing data to determine loop diuretic use. The specificity of diagnosis of systolic heart failure was examined by blinded case note review.
Results The database contained 153 836 reports on 63 309 individuals. The lexicon comprised 488 keywords or phrases. When applied to the data 145 525 reports were classified (94.4%), while 8584 remained unclassified. (5969 (70%) contained no information in the free text fields, and the remainder provided either insufficient data on left ventricular function or severe spelling or typographical errors, preventing matching.) 19 758 were classified as having LVSD (5378 (27%) mild, 818 (4%) mild to moderate, 4646 (24%) moderate, 583 (3%) moderate to severe and 8333 (42%) severe). The validation of 1000 reports reviewed for the presence or absence of LVSD found concurrence with the algorithm in 980 (98%) cases. Blinded review of the stored movies and images revealed a 90% concordance for the presence or absence of LVSD. Record linkage with the dispensed prescription dataset identified 9875 individuals with LVSD who also received loop diuretic therapy. Validation, by case note review, demonstrated a 91% concordance with a clinical diagnosis of systolic HF.
Conclusion A computer algorithm can quickly and accurately identify the degree of LVSD from the free text component on an echocardiogram report and the presence of LVSD and combined with loop diuretic use is specific for a diagnosis of systolic heart failure.

013 AUDIT OF TERTIARY HEART FAILURE OUTPATIENT SERVICE TO ASSESS COMPLIANCE WITH UPDATED NICE GUIDELINES

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Background Clinical audit provides a mechanism to review the quality of patient care, and highlight areas for further development. The National Institute of Clinical Excellence (NICE) updated the clinical guidelines for chronic heart failure (HF) in August 2010. Incorporated into this update were audit criteria, which were used to create an electronic tool to assess current outpatient management.
Methods The audit targeted patients with HF secondary to left ventricular disease attending a tertiary cardiac centre in London. After an initial pilot period using hard copy proformas, the audit was extended in electronic format to all HF clinics within the institution. This enabled the capture of demographical data, diagnosis, treatment, monitoring including heart rhythm and rate, measures of clinical follow-up, and the compliance with rehabilitation.
Results A total of 282 patients were included in the 8-month audit, of which 71% were male. The majority of patients were elderly, with a mean age of 68 years, and most lived outside of London (68%). The three commonest HF aetiologies were ischaemic heart disease (40%), idiopathic dilated cardiomyopathy (20%) and primary valvular disease (12%). Treatment demonstrated 89% correctly prescribed a β-blocker, 91% correctly prescribed an ACE-inhibitor or angiotensin receptor antagonist and 64% correctly prescribed an aldosterone antagonist. Rehabilitation questions changed after 3 months. Within the initial 155 patients, 15% were offered a rehabilitation programme. The subsequent 127 patients were audited using three questions, demonstrating that 6% were referred, and 1% were enrolled into a rehabilitation programme, and 36% were educated regarding the benefits of exercise for HF.
Discussion The experience throughout this audit was positive as it was flexible and well supported by the audit department. The electronic proforma is easily adaptable to incorporate subsequent clinical or research questions as desired. Treatment and monitoring reflect national recommendations, but rehabilitation referrals are below desired levels. A minority of patients have been referred to or