HOSPITAL CHRONICLES 2016, 11(2): 117–126

CARDIOLOGY CORNER

# Cardiology News / Recent Literature Review / First Quarter 2016*

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**ACC** 65th Annual Session: Chicago, 2-4/4/2016
**HRS** 37th Annual Meeting: San Francisco, 4-7/5/16
**CardioStim/Europace**: Nice, 8-11/6/2016
**Euro PCR**: Paris, 17-20/5/2016
**ESC** Meeting: Rome, 27-31/8/2016
**HCS** Panhellenic Congress**:** Athens, 20-22/10/2016
**TCT** Conference: Washington, DC, 29/10-2/11/2016
**AHA** Scientific Sessions: New Orleans, 12-16/11/2016

### Exercise-Based Cardiac Rehabilitation Reduces the Risk of Cardiovascular (CV) Mortality and Hospital Admission and Improves Quality of Life in Patients With Coronary Heart Disease

Meta-analyses of exercise-based cardiac rehabilitation (CR) studies (n=63) comprising 14,486 participants with median follow-up of 1 year indicated that CR led to a reduction in CV mortality (relative risk - RR: 0.74) and the risk of hospital admissions (RR: 0.82). There was no significant effect on mortality, MI, or revascularization. The majority of studies (14 of 20) showed higher levels of health-related quality of life following exercise-based CR compared with control subjects (Anderson L et al, *J Am Coll Cardiol* 2016;67:1-12).

### Coronary CT Angiography (CCTA), Applied Early in Suspected Acute Coronary Syndrome (ACS), is Safe and Associated with Less Outpatient Testing and Lower Costs. However, in the Era of High-Sensitivity (hs)-Troponins, it does not Identify more Patients with Significant CAD Requiring Coronary Revascularization, nor does it Shorten Hospital Stay or Allow for More Immediate Discharge from the Emergency Department (ED)

Among 500 patients (age 54±10 years, 47% women) with symptoms suggestive of an ACS at the ED, there was no difference in the primary endpoint (22 or 9% patients underwent coronary revascularization within 30 days in the CCTA group and 17 or 7% in the standard care group; p= NS). Discharge from the ED was not more frequent after CCTA (65% vs 59%, p= NS), and length of stay was similar (6.3 h in both groups; p= NS). The CCTA group had lower direct medical costs (€337 vs €511, p <0.01) and less outpatient testing (10 or 4% vs 26 or 10%, p <0.01). There was no difference in incidence of undetected ACS (Dedic A et al, *J Am Coll Cardiol* 2016; 67:16-26).

### Cost-Effectiveness of Transcatheter Aortic Valve Implantation (TAVI) with a Self-Expanding Prosthesis vs Surgical Aortic Valve Replacement (AVR): TAVI in Patients at High Risk for Complications with AVR Provides Important Incremental Health Benefits at Reasonable Incremental Costs and is an Acceptable Value for the U.S. Health Care System

Relative to AVR, TAVI reduced initial length of stay an average of 4.4 days, decreased the need for rehabilitation services at discharge, and resulted in superior 1-month quality of life. Index admission and projected lifetime costs were higher with TAVI than with AVR (differences $11,260 and $17,849 per patient, respectively), whereas TAVI was projected to provide a lifetime gain of 0.32 quality-adjusted life-years (QALY; 0.41 LY) with 3% discounting. Lifetime incremental cost-effectiveness ratios were $55,090 per QALY gained and $43,114 per LY gained. N.B.: mean procedure costs: $37,920 for TAVI & $14,258 for AVR (Reynolds MR et al, *J Am Coll Cardiol* 2016;67:29-38).

### 5-Year Follow-Up of SYNTAX: for Patients with Complex Coronary Disease, CABG Conferred a Lower Rate of Cardiac Death After Than PCI, and Patients who Had PCI with First-Generation DES were at Higher Risk of Fatal MI Than Those Who Had CABG

In this cohort, there were 97 deaths after CABG and 123 deaths after PCI at 5 years. After CABG, 49.4% of deaths

were cardiovascular (CV), with the greatest cause being heart failure, arrhythmia, or other causes (24.6%), whereas after PCI, the majority of deaths were CV (67.5%) and as a result of MI (29.3%). All-cause death rates were not significantly different between CABG and PCI (11.4% vs 13.9%; p=NS), whereas there were significant differences for CV (5.8% vs 9.6%; p=0.008) and cardiac death (5.3% vs 9%; p=0.003), which were caused primarily by a reduction in MI-related death with CABG compared with PCI (0.4% vs 4.1%; p <0.0001). Treatment with PCI vs CABG was an independent predictor of cardiac death (hazard ratio: 1.55; p=0.045). The difference in MI-related death was mostly seen in patients with diabetes, 3-vessel disease, or high SYNTAX scores (Milojevic M et al, *J Am Coll Cardiol* 2016;67:42-55).

**TRANSLATE-ACS: after AMI and PCI, Patients Who Develop Bleeding During Dual Antiplatelet Therapy (DAPT) Exhibit Worse Health Status and Quality of Life After 6 Months Proportionate to Severity of Bleeding**

Of 9,290 patients with AMI treated with PCI, bleeding events on contemporary DAPT occurred as follows: any Bleeding Academic Research Consortium (BARC) bleeding: 24.2%; BARC 1: 9.1%; BARC 2: 13.8%; BARC 3: 1.1%; BARC 4: 0.03%; and BARC 5: 0%. Those who experienced any BARC bleeding had lower scores across all quality of life (QOL) domains. Any BARC bleeding was independently associated with 6-month QOL score (p <0.0001) in a stepwise fashion with increasing BARC severity (Amin AP et al, *J Am Coll Cardiol* 2016;67:59-65.66: 2173-2184).

**MESA (Multi-Ethnic Study of Atherosclerosis): Nontraditional CV Risk Markers (Coronary Artery Calcium-CAC Score, Ankle–Brachial Index-ABI, hsCRP Levels, and Family History - FH) were each Independently Associated with Atherosclerotic CV Disease (ASCVD) Beyond Traditional Risk Factors**

Of 5,185 participants not prescribed statins at baseline (mean age 61 years; 53% women, 9.8% diabetes, 13.6% current smokers), after 10 years of follow-up, 320 (6.2%) ASCVD events occurred. CAC score, ABI, and FH were independent predictors of ASCVD events. CAC score modestly improved the discriminative ability of the risk estimator compared with other nontraditional risk markers (Yeboah J et al, *J Am Coll Cardiol* 2016;67:139-147).

**Infective Endocarditis (IE): A Systematic Search Can Identify the Source of Bacteremia in 3/4 of Patients With IE, and in >1/3 of Cases, Additional Potential Portals of Entry (POE) Can Be Found That Pose a Risk for Future Infections**

The POEs of the present IE episodes were identified in 74% of the 318 included patients. The most frequent POE was cutaneous (40%). It was mainly (62% of cutaneous POEs) associated with health care and with intravenous drug use. The second most frequent POE was oral or dental (29%). A dental infectious focus was more often involved (59%) than a dental procedure (12%). POEs were gastrointestinal in 23% of patients. Colonic polyps were found in half of patients and colorectal adenocarcinomas in 14%. The authors advise the systematic performance of stomatologic examinations in patients with IE and performance of colonoscopy in patients ≥50 years of age or at high risk for colorectal cancer (Delahaye F et al, *J Am Coll Cardiol* 2016;67:151-158).

**ATRIA Study: Among Patients With Diabetes and Atrial Fibrillation (AF), the Duration of Diabetes is a More Important Predictor of Ischemic Stroke Than Glycemic Control**

Among 2,101 diabetic patients (40% with duration <3 years and 60% ≥3 years at baseline) and 1,933 included in the hemoglobin A1c (HbA1c) analysis (46% with HbA1c <7%, 36% at 7%-8.9%, & 19% ≥9%), duration of diabetes ≥3 years was associated with an increased rate of ischemic stroke compared with duration <3 years (hazard ratio - HR: 1.74). The increased stroke rate was observed in older (age ≥75 years) and younger (age <75 years) patients. Neither poor glycemic control (HbA1c ≥9%, HR: 1.04) nor moderately increased HbA1c (7-8.9%, HR: 1.21) were significantly associated with an increased rate of ischemic stroke compared with patients who had HbA1c <7% (Ashburner JM et al, *J Am Coll Cardiol* 2016;67:239-247).

**SMILE Trial: in Multivessel Non–ST-Segment Elevation Myocardial Infarction (NSTEMI) Patients, Complete 1-Stage Coronary Revascularization is Superior to Multistage PCI Regarding Major Adverse Cardiovascular / Cerebrovascular Events (MACCE)**

Among 584 patients randomly assigned to 1-stage (1S-PCI) or multistage PCI (MS-PCI), the occurrence of the primary endpoint (MACCE) was significantly lower in the 1-stage group (1S-PCI: n=36-13.6% vs. MS-PCI: n=61-23.2%; hazard ratio - HR: 0.549; p=0.004). The 1-year rate of target vessel revascularization was significantly higher in the MS-PCI group (1S-PCI: n=22-8.3% vs MS-PCI: n=40-15.2%; HR: 0.522; p=0.01). Analysis of cardiac death and MI showed no significant differences (Sardella G et al, *J Am Coll Cardiol* 2016; 67:264-272).

**IMPROVE-IT: In Addition to Reducing First Events in Patients After an ACS, Combination Therapy With Ezetimibe Plus Simvastatin Also Reduced Total Events Compared With Simvastatin Alone**

During a median 6-year follow-up, among 18,144 patients,

there were 9,545 total cardiovascular (CV) events (56% first and 44% subsequent events), which were significantly reduced by 9% with ezetimibe/simvastatin vs placebo/simvastatin (incidence-rate ratio - RR: 0.91; p=0.007), as was the composite endpoint of CV death, MI, or stroke (RR: 0.88; p=0.002). The reduction in total events was driven by decreases in total nonfatal MI (RR: 0.87; p=0.004) and total nonfatal stroke (RR: 0.77; p=0.005) (Murphy SA et al, *J Am Coll Cardiol* 2016;67:353-361).

**MADIT-CRT Trial: Relative Wall Thickness (RWT) is Inversely Related to the Risk of Ventricular Tachycardia (VT) in Patients with Systolic Heart Failure (HF) and LBBB / CRT-D Conferred an Increase in RWT and Reduction in VT Risk**

Relative wall thickness (RWT), defined as 2 times posterior wall thickness divided by the left ventricular (LV) diastolic diameter, is a measure of LV geometry and may be a marker for adverse events in patients with LV dysfunction. In 1,260 patients with mild HF and LBBB, RWT was the most powerful echocardiographic measure for estimating the risk of VT. Patients with low RWT (<0.24) had 83% (p <0.001) increased risk for VT and 68% (p <0.001) increase in VT risk or death (VT/death). Each 0.01-unit decrease in RWT was associated with 12% (p <0.001) and 10% (p <0.001) increases in the risk of VT and VT/death, respectively. Cardiac resynchronization therapy with defibrillator (CRT-D) was associated with a greater increase in RWT compared with ICD at 1 year (4.6±6.8% vs 1.5±2.7%; p <0.001), and every 10% increase in RWT in CRT-D patients was associated with 34% (p=0.027) and 36% (p=0.009) reductions in the risk of subsequent VT and VT/death, respectively (Biton Y et al, *J Am Coll Cardiol* 2016;67:303-312).

**CYCLE Trial: IV Cyclosporine A (CsA) Immediately Before Primary Coronary Angioplasty Within 6 h from Symptom Onset in Patients With STEMI did not Improve Markers of Myocardial Injury, Ventricular Remodeling, or Clinical Outcomes, Indicating that this Strategy did not Prevent or Reduce Reperfusion-Related Injury**

In 410 patients, aged 63±12 years, with large STEMI committed to primary PCI, randomly assigned within 6 h of symptom onset to 2.5 mg/kg IV CsA (n=207) or control (n=203) groups, time from symptom onset to first ante-grade flow was 180±67 min; a median of 5 ECG leads showed ST-segment deviation; ~50% of MIs were anterior. ST-segment resolution ≥70% was found in 52% of CsA patients and 49% of controls (p=NS). Median hs-cTnT on day 4 was 2,160 ng/l in CsA and 2,068 ng/l in controls (p=NS). The 2 groups did not differ in LV ejection fraction on day 4 and at 6 months. Infarct site did not influence CsA efficacy. There were no acute allergic reactions or nonsignificant excesses of 6-month mortality (5.7% CsA vs 3.2% controls, p=NS) or cardiogenic shock (2.4% CsA vs 1.5% controls, p=NS) (Ottani F et al; *J Am Coll Cardiol* 2016;67:365-374).

**Chlorthalidone: Low-Dose Chlorthalidone, 6.25 mg/d, is More Effective than Hydrochlorothiazide (HCTZ), 12.5 mg/d, in Reducing Daytime, Nighttime, and Mean 24-h Ambulatory Blood Pressure Over 4 - 12 Weeks with only 6.3% Hypokalemia and Can be Prescribed as Initial Therapy for Treatment of Hypertension, Whereas Low-Dose HCTZ Should no Longer be Used**

Chlorthalidone 6.25 mg/d (n=16) was compared with HCTZ 12.5 mg/d (n=18), or HCTZ-CR 12.5 mg (n=20) over 12-weeks in 54 patients with stage 1 hypertension. All 3 treatments significantly (p <0.01) lowered office blood pressure (BP) at weeks 4 and 12 from baseline. At weeks 4 and 12, significant reductions in systolic and diastolic 24-h ambulatory and nighttime BP (p <0.01) were observed with chlorthalidone but not with HCTZ. At weeks 4 (p=0.015) and 12 (p=0.020), nighttime systolic ambulatory BP was significantly lower in the chlorthalidone group than in the HCTZ group. The HCTZ-CR group showed a significant (p <0.01) reduction in 24-h BP. All 3 treatments were generally safe and well tolerated (Pareek AK et al, *J Am Coll Cardiol* 2016;67:379-389).

**REACH Registry: Pulse pressure (PP), Arising as a Consequence of Arterial Stiffness in Patients With Atherosclerosis, is a Marker of Cardiovascular Disease Burden and Identifies Patients at Risk for Ischemic Events According to a Large, International Registry of >45,000 Participants With Established or at High Risk for Arterial Disease**

In a 45,087 cohort (aged 68±10 years, 35% women, 81% treated for hypertension), with mean blood pressure of 138±19/79±11 mmHg, rendering a mean PP of 49±16 mmHg, on univariate analysis, increasing PP quartile was associated with worse outcomes (p <0.05). After adjusting for gender, age, current smoking status, history of hypercholesterolemia, history of diabetes, aspirin use, statin use, blood pressure drug use, and mean arterial pressure, PP quartile was still associated with all outcomes except all stroke and cardiovascular death (p <0.05) (Selvaraj S et al, *J Am Coll Cardiol* 2016;67:392-403).

**In Patients With Degenerative Mitral Regurgitation (MR) Undergoing Surgical Repair With Annuloplasty, Recurrences are Low/≥Mild Early Post-Operative MR is Associated With Adverse Ventricular Remodeling and Higher Rates of Recurrent MR, Need for Reoperation, and Death Than in Patients With None-To-Trivial Early Post-Operative MR**

Among 1,218 patients (mean age 64±13 years, mean ejec-

tion fraction 63±9%, 864 - 71% men), the 15-year incidence of recurrent MR (MR ≥2) was 13.3%, mitral reoperation 6.9%, and overall mortality 44%. Repair before 1996 independently predicted MR recurrence (hazard ratio: 1.52). Additional determinants were: age, mild intraoperative residual MR, anterior leaflet prolapse, bileaflet prolapse, perfusion time >90 min, and lack of annuloplasty. Recurrence of ≥ moderate MR was associated with adverse left ventricular remodeling and increased likelihood of late death (hazard ratio: 1.72). After 1996, MR recurrence decreased markedly following the first year after intervention (Suri RM et al, *J Am Coll Cardiol* 2016;67:488-498).

**THERMOCOOL VT Trial: Radiofrequency Ablation of VT is Effective in Preventing Recurrent VT and ICD Shocks, Reducing Hospitalizations, and Improving Quality of Life for ≥3 Years**

In patients (n=249; mean age 67.4 y) with sustained monomorphic ventricular tachycardia (VT) associated with coronary disease, the cardiovascular-specific adverse events rate was 3.9% (9 of 233) with no strokes. Noninducibility of targeted VT was achieved in 75.9% of patients. Post-ablation median hospitalization was 2 days. At 6 months, 62% (114 of 184) of patients had no sustained monomorphic VT recurrence; the proportion of patients with ICD shocks decreased from 81.2% to 26.8% (p <0.0001); the frequency of VT in ICD patients with recurrences was reduced by ≥50% in 63.8% of patients; and quality of life improved (p <0.001). Patient-reported VT remained steady for 1, 2, and 3 years at 22.7%, 29.8%, and 24.1%, respectively. Amiodarone use and hospitalization decreased at 1-3 years (Marchlinski FE et al, *J Am Coll Cardiol* 2016;67:674-683).

**SORT OUT IV: Rate of Major Adverse Cardiovascular Events (MACE) at 5 Years is Lower in Patients Treated with Everolimus-Eluting Coronary Stents (EES) than in those Treated with Sirolimus-Coated Stents (SES), Attributable Largely to a Lower Rate of Late Stent Thrombosis**

Among 2,771 patients at 5-years, MACE occurred in 14% and 17.4% in the EES and SES groups, respectively (hazard ratio - HR: 0.80, p=0.02). The MACE rate did not differ significantly within the first year (HR: 0.96, p=0.79), but from years 1 through 5, the MACE rate was lower with EES (HR: 0.71; p=0.006). Definite stent thrombosis was lower with EES (0.4%) than with SES (2%; HR: 0.18), with a lower risk of very late definite stent thrombosis in the EES group (0.2% vs 1.4%, respectively; HR: 0.16). When censoring the patients at the time of stent thrombosis, we found no significant differences between the 2 stent groups for MACE rates (HR: 0.89; p=0.23), target lesion revascularization (HR: 0.90, p=0.55), and MI (HR: 0.93; p=0.72) (Jensen LO et al, *J Am Coll Cardiol* 2016;67:751-762).

**Patients With PFO Who Develop Cryptogenic Ischemic Stroke Face Relatively Low Rates of Recurrent Cerebral Ischemic Events During Medical Therapy With or Without Device Closure, But Pooled Results of Randomized Trials Show Lower Stroke Rates With Percutaneously Implanted Device Closure Than With Medical Therapy Alone**

According with data on 2 devices (STARFlex, NMT Medical, Inc., Boston, MA & Amplatzer, AGA Medical/St. Jude Medical, St. Paul, MN) evaluated in 3 trials in 2,303 patients, PFO closure was not significantly associated with the primary composite outcome (stroke, TIA, or death). The difference became significant after covariate adjustment (hazard ratio - HR: 0.68; p=0.049). For stroke, all comparisons were statistically significant (HRs 0.58, p=0.043). In analyses limited to the 2 disc occluder device trials, the effect of closure was not significant for the composite outcome, but was for the stroke outcome (HR: 0.39; p=0.013). Subgroup analyses did not identify significant heterogeneity of treatment effects. AF was more common in closure patients (Kent DM et al, *J Am Coll Cardiol* 2016;67:907-917).

**Patients With LQT3 Respond Incompletely to Beta-Blockers and Face an Unfavorable Prognosis / Mexiletine Exerted Effective Antiarrhythmic Effects in this Cohort, Representing a Genotype-Specific Treatment for an Inherited Arrhythmogenic Substrate**

In 34 LQT3 patients (19 or 56% male; median age 22 years at beginning of treatment with mexiletine; median QTc interval before therapy 509 ms; median duration of oral mexiletine 3 years; average daily dose 8±0.5 mg/kg), mexiletine significantly shortened QTc (by 63±6 ms; p <0.0001) and reduced the percentage of patients with arrhythmic events (from 22% to 3%; p=0.031), the mean number of arrhythmic events per patient (from 0.43±0.17 to 0.03±0.03; p=0.027), and the annual rate of arrhythmic events (from 10.3% to 0.7%; p=0.0097) (Mazzanti A et al, *J Am Coll Cardiol* 2016;67:1053-1058).

**PEGASUS-TIMI 54 Trial: In Patients With Prior MI on Extended Dual Antiplatelet Therapy, Ticagrelor 60 mg bid Provides a Degree of Platelet Inhibition Comparable to that Achieved with 90 mg bid, which May Explain the Nearly Equivalent Efficacy of these Doses for Prevention of Recurrent Ischemic Events**

In 180 patients mean pre- and post-dose plasma levels of ticagrelor were 35% and 38% lower, respectively, with 60 mg vs 90 mg bid. Both doses achieved high levels of platelet inhibition pre- and post-dose, with numerically slightly more variability with 60 mg: pre-dose PRU values were 59±63 and 47±43 for ticagrelor 60 and 90 mg, respectively (p=NS). High

platelet reactivity (PRU >208) was rare with the 60-mg predose and was absent post-dose. Platelet reactivity pre- and post-dose, as measured by light transmittance aggregometry or vasodilator-stimulated phosphoprotein assays, was numerically but not significantly lower with 90 mg than with 60 mg. Aspirin response was not affected by either dose (Storey RF et al, *J Am Coll Cardiol* 2016;67:1145-1154.).

**PREDICTS Study: Most Patients with Severe LV Dysfunction in the Acute Phase of MI Exhibit Improvement in LV Function 90 Days Later / Prior MI, Early VF or Cardiac Arrest, Peak Serum Troponin, and EF Early After Presentation are Predictors of Later Myocardial Recovery**

Among patients with ejection fraction (EF) ≤35% at the time of MI (n= 231), 43% had persistent EF ≤35%, 31% had an EF of 36-49%, and 26% had an EF ≥50% at 3 months. Predictors for EF recovery to >35%, identified in a separate cohort (n=236) included EF at presentation, length of stay, prior MI, lateral wall motion abnormality at presentation, and peak troponin. The model that best predicted recovery of EF to ≥50% included EF at presentation, peak troponin, prior MI, and presentation with ventricular fibrillation or cardiac arrest. After predictors were transformed into point scores, the lowest point scores predicted a 9% and 4% probability of EF recovery to >35% and ≥50%, respectively, whereas profiles with the highest point scores predicted an 87% and 49% probability of EF recovery to >35% and ≥50%, respectively (Brooks GC et al, *J Am Coll Cardiol* 2016;67:1186-1196).

**BRUISE CONTROL INFECTION Study: Strategies to Reduce Pocket Hematomas in Device Implants, Such as Continuing Oral Anticoagulants Rather Than Bridging with Heparin, May Reduce Long-Term Infection Risk**

Among 659 patients the 1-year device-related infection rate was 2.4% (16/659). Infection occurred in 11% of patients (7/66) with previous clinically significant pocket hematoma (CSH) and in 1.5% (9/593) without CSH. CSH was the only independent predictor and was associated with a >7-fold increased risk of infection (hazard ratio: 7.7; p<0.0001). Empiric antibiotics upon development of hematoma did not reduce long-term infection risk (Essebag V et al, *J Am Coll Cardiol* 2016; 67:1300-1308).

**CHAMPION PHOENIX Trial: Cangrelor Reduced the Odds of Major Adverse Cardiovascular Events and Stent Thrombosis in Women and Men and Appeared to Offer Greater Net Clinical Benefit Than Clopidogrel**

Cangrelor, an IV ADP receptor antagonist leading to potent and reversible inhibition of platelet aggregation, given in a randomized way with clopidogrel to 11,145 patients undergoing elective or urgent PCI (3051 or 28% women) reduced the odds of the primary end point (death, MI, revascularization, stent thrombosis) by 35% in women (odds ratio - OR, 0.65); and by 14% in men (OR, 0.86) compared with clopidogrel. Cangrelor reduced the odds of stent thrombosis by 61% in women (OR, 0.39) and 16% in men (OR, 0.84). The odds of severe bleeding were similar in women and men treated with cangrelor (0.3% vs 0.2% in women; 0.1% vs 0.1%, *for* men) vs clopidogrel. Cangrelor increased the odds of moderate bleeding in women (0.9% vs 0.3%, *P*=0.02), but not in men (0.2% vs 0.2%, *P*=NS). The net clinical benefit favored cangrelor in both women (OR, 0.68) and men (OR, 0.87) (O'Donoghue ML et al, *Circulation* 2016;133: 248-255).

**National Trends in the Use of Cardiac Resynchronization Therapy (CRT) With or Without ICD: The Majority (86%) of Patients in this US Cohort Underwent Implantation of CRT-D**

Among 311,086 admissions for CRT implant, CRT-D was the most common device type (86.1%), including in patients ≥75 years of age with ≥5 comorbidities (75.5%). Multivariate predictors of CRT-D implant included: prior ventricular arrhythmia (rate ratio - RR, 1.14), ischemic heart disease (RR, 1.11), male gender (RR, 1.10), black race (RR, 1.06), and Northeast geographic region (RR, 1.06). There was significant interhospital variation in the use of CRT-D (10–90 percentile range, 73%–98% CRT-D) (Lindvall C et al, *Circulation* 2016; 133: 273-281).

**Sugar-Sweetened Beverage (SSB) Consumption is Associated With Change of Visceral Adipose Tissue (VAT) Over 6 Years of Follow-Up**

The quantity and quality of abdominal adipose tissue were measured using computed tomography in 1003 participants (mean age 45.3 years, 45% women) at baseline and 6 years later. Higher SSB intake was associated with greater change in VAT volume (P trend<0.001). VAT volume increased by 658 $cm^3$, 649 $cm^3$, 707 $cm^3$, and 852 $cm^3$ from nonconsumers (none to <1 serving/mo) to non-daily (1 serving/mo to <1 serving/week, 1 serving/week to 1 serving/d) to daily (≥1 serving/d) consumers. Higher SSB intake was also associated with greater decline of VAT attenuation (P trend=0.007); however, the association became nonsignificant after additional adjustment for VAT volume change. In contrast, diet soda consumption was not associated with change in abdominal adipose tissue (Ma J et al, *Circulation* 2016;133:370-7).

**Aerobic Interval Training (AIT) Reduces the Burden of Atrial Fibrillation (AF) in the Short Term**

Patients with nonpermanent AF were randomized to AIT (n=26) consisting of four 4-minute intervals at 85% to 95% of peak heart rate 3 times a week for 12 weeks or to a control group (n=25) continuing regular exercise habits. Mean time

in AF measured by an implanted loop recorder increased from 10.4% to 14.6% in the control group and was reduced from 8.1% to 4.8% in the exercise group (*P*=0.001). AF symptom frequency (*P*=0.006) and AF symptom severity (*P*=0.009) were reduced after AIT. AIT improved $\dot{V}O_2$ peak, left atrial and ventricular ejection fraction, quality-of-life, and lipid values compared with the control group. There was a trend toward fewer cardioversions and hospital admissions after AIT (Malmo V et al, *Circulation* 2016; 133: 466-473**).**

**The S-Wave in Lead I: A New Electrocardiographic Marker of Sudden Death in Brugada Syndrome (BS)**

During follow-up (48±38 months) of 347 patients (78.4% male; age 45±13.1 years) with spontaneous type 1 BS but no history of cardiac arrest (91.1% initially asymptomatic, 5.2% with history of atrial fibrillation - AF, and 4% with history of syncope), 276 (79.5%) patients remained asymptomatic, 39 (11.2%) developed syncope, and 32 (9.2%) developed ventricular fibrillation (VF) / sudden cardiac death (SCD). Patients who developed VF/SCD had a lower prevalence of SCN5A gene mutations (p=0.009) and a higher prevalence of positive electrophysiological study results (p <0.0001), a family history of SCD (p=0.03), and AF (p <0.0001). The most powerful marker for VF/SCD was a significant S-wave (≥0.1 mV and/or ≥40 ms) in lead I. In multivariate analysis, the duration of S-wave in lead I ≥40 ms (hazard ratio: 39.1) and AF (hazard ratio: 3.7) were independent predictors of VF/SCD during follow-up (Calo L et al, *J Am Coll Cardiol* 2016;67:1427–1440).

**Pooled Analysis: In Patients With Brugada Syndrome (BS), Arrhythmias Induced With Programmed Ventricular Stimulation are Associated With Future Arrhythmia Risk / Induction With Fewer Extrastimuli is Associated With Higher Risk / However, Clinical Risk Factors are Important Determinants of Arrhythmia Risk, and Lack of Induction does not Necessarily Portend Low Risk, Particularly in Patients With High-Risk Clinical Features**

Analysis of 8 studies comprising 1312 patients with BS experiencing 65 cardiac events (median follow-up, 38.3 months) indicated a total of 527 patients with inducible arrhythmias. Induction was associated with cardiac events during follow-up (hazard ratio, 2.66; *P* <0.001), with the greatest risk observed among those induced with single or double extrastimuli. Annual event rates varied by syncope history, presence of spontaneous type 1 ECG pattern, and arrhythmia induction. The lowest risk occurred in individuals without syncope and with drug-induced type 1 patterns (0.23% for no induced arrhythmia with up to 2 extrastimuli; 0.45% for induced arrhythmia), and the highest risk occurred in individuals with syncope and spontaneous type 1 pattern (2.55% for no induced arrhythmia; 5.60% for induced arrhythmia) (Sroubek J et al, *Circulation* 2016; 133: 622-630).

**Brugada Syndrome is Common in Women (42% in this Database) / Clinical Presentation is Less Severe than Men, With More Asymptomatic Status and Less Spontaneous Type I ECG and Prognosis is More Favorable, With an Event Rate of 0.7% Year. However, Women With Sudden Cardiac Death (SCD) or Previous Sinus Node Dysfunction (SND) are at Higher Risk of Arrhythmic Events**

Among 228 women presenting with spontaneous or drug-induced Brugada type I ECG (age 41.5±17.3 years; clinical presentation with SCD in 6 or 2.6%, syncope in 51 or 22.4% and 171 or 75% asymptomatic) compared with 314 men with the same diagnosis, spontaneous type I ECG was less common (7.9% vs 23.2%, p <0.01) and less ventricular arrhythmias were induced during programmed electrical stimulation (5.5% vs 22.3%, p <0.01). An ICD was implanted in 64 women (28.1%). During follow-up of 73.2±56.2 months, 7 patients developed arrhythmic events, constituting an event rate of 0.7% per year (as compared with 1.9% per year in men, p=0.02). Presentation as SCD or SND was risk factor significantly associated with arrhythmic events (hazard risk - HR 25.4 and 9.1) (Sieira J et al, *Heart* 2016; 102:452-458).

**WOSCOPS: In High-Risk Men With Elevated LDL Cholesterol but Without a History of MI, Statin Therapy for 5 Years was Associated With a Legacy Benefit, With Improved Survival and a Substantial Reduction in CV Disease Outcomes Over 20-Years**

Among 6595 men, randomized to receive pravastatin 40 mg/d or placebo for an average of 4.9 years, analysis of major incident events over 20 years indicated that men allocated to pravastatin had reduced all-cause mortality (hazard ratio-HR, 0.87; P=0.0007), attributable mainly to a 21% decrease in cardiovascular (CV) death (HR, 0.79; P=0.0004). There was no difference in non-CV or cancer death rates between groups. Cumulative hospitalization event rates were lower in the statin-treated arm: by 18% for any coronary event (P=0.002), by 24% for myocardial infarction (MI) (P=0.01), and by 35% for heart failure (P=0.002). There were no significant differences between groups in hospitalization for non-CV causes (Ford I et al, *Circulation* 2016;133:1073-1080).

**Two-Year Outcomes of Surgery for Severe Ischemic Mitral Regurgitation (MR): No Significant Difference Between Mitral-Valve Repair and Replacement in LV Reverse Remodeling or Survival / MR Recurred More Frequently in the Repair Group, With More Heart-Failure–Related Adverse Events and CV Admissions**

In patients (n=251) with severe ischemic MR, randomized

to mitral-valve (MV) repair or replacement, at 2 years, LV end-systolic volume (LVESV) was 52.6±27.7 ml/m$^2$ with MV repair and 60.6±39.0 ml/m$^2$ with MV replacement. Two-year mortality was 19% in the repair and 23.2% in the replacement group (hazard ratio, 0.79; P=0.39). The rate of recurrence of moderate or severe MR at 2 years was higher in the repair than in the replacement group (58.8% vs 3.8%, P <0.001). There were no significant between-group differences in serious adverse events and overall readmissions, but patients in the repair group had more serious adverse events related to heart failure (P=0.05) and cardiovascular (CV) re-admissions (P=0.01). There was a trend toward greater quality of life improvement in the replacement group (P=0.07) (Goldstein D et al, *N Engl J Med* 2016; 374:344-353).

**The Leadless Intracardiac Transcatheter Pacemaker, Compared to Historical Conrols, Met the Prespecified Safety and Efficacy Goals / It Had a Safety Profile Similar to that of a Transvenous System With Low and Stable Pacing Thresholds**

The Micra transcatheter pacemaker was successfully implanted in 719 of 725 patients (99.2%). The primary safety end point (freedom from major complications) was 96% (P <0.001 for the comparison with the safety performance goal of 83%); there were 28 major complications in 25 of 725 patients, and no dislodgements, all fewer compared to the control patients (hazard ratio, 0.49; P=0.001). The rate of the primary efficacy end point (percentage of patients with low and stable pacing capture thresholds at 6 months, i.e. ≤2.0 V at a pulse width of 0.24 ms and an increase of ≤1.5 V from the time of implantation) was 98.3% (P <0.001 for the comparison with the efficacy performance goal of 80%) among 292 of 297 patients with paired 6-month data (Reynolds D et al, *N Engl J Med* 2016; 374:533-541).

**Coronary Artery Surgery: The Administration of Preoperative Aspirin Resulted in Neither a Lower Risk of Death or Thrombotic Complications Nor a Higher Risk of Bleeding Compared With Placebo**

Patients (n=2100) who were scheduled to undergo coronary artery surgery and were at risk for perioperative complications were randomly assigned to receive 100 mg of aspirin (n=1047) or placebo (n=1053) preoperatively. A primary outcome event (death and thrombotic complications, i.e. nonfatal myocardial infarction, stroke, pulmonary embolism, renal failure, or bowel infarction within 30 days after surgery) occurred in 202 patients in the aspirin group (19.3%) and in 215 patients in the placebo group (20.4%) (relative risk, 0.94; P=NS). Major hemorrhage leading to reoperation occurred in 1.8% of patients in the aspirin group and in 2.1% of patients in the placebo group (P=NS), and cardiac tamponade occurred at rates of 1.1% and 0.4%, respectively (P=0.08) (Myles PS et al, *N Engl J Med* 2016; 374:728-737).

**ACT I Trial: In Asymptomatic Patients With Severe Carotid Stenosis Who were not at High Risk for Surgical Complications, Stenting was Noninferior To Endarterectomy at 1 Year / At 5 Years, there were no Significant Differences Between the Study Groups in Rates of Stroke and Survival**

Among 1453 asymptomatic patients <79 years with severe carotid stenosis, stenting with embolic protection was noninferior to endarterectomy with regard to the primary composite end point (death, stroke, or MI within 30 days) (event rate, 3.8% and 3.4%, respectively; P=0.01 for noninferiority). The rate of stroke or death within 30 days was 2.9% in the stenting group and 1.7% in the endarterectomy group (P=NS). From 30 days to 5 years after the procedure, the rate of freedom from ipsilateral stroke was 97.8% in the stenting group and 97.3% in the endarterectomy group (P=NS), and overall survival rates were 87.1% and 89.4%, respectively (P=0.21). The cumulative 5-year rate of stroke-free survival was 93.1% in the stenting group and 94.7% in the endarterectomy group (P=NS) (Rosenfield K et al, *N Engl J Med* 2016; 374:1011-1020).

**CREST 10-Year Results: No Significant Difference Between Patients Who Underwent Stenting and Those With Endarterectomy in the Risk of Periprocedural Stroke, MI, or Death and Subsequent Ipsilateral Stroke**

Among 2502 patients, there was no significant difference in the rate of the primary composite end point (stroke, MI or death) between the stenting group (11.8%) and the endarterectomy group (9.9%) over 10 years of follow-up (hazard ratio - HR, 1.10). Postprocedural ipsilateral stroke over the 10-year follow-up occurred in 6.9% of the patients in the stenting group and in 5.6% of those in the endarterectomy group; the rates did not differ significantly between the groups (HR, 0.99). No significant between-group differences with respect to either end point were detected when symptomatic patients and asymptomatic patients were analyzed separately (Brott DG et al, *N Engl J Med* 2016; 374:1021-1031)**.**

**Warning Symptoms Frequently Occur Before Sudden Cardiac Arrest (SCA), But Most are Ignored / Emergent Medical Care Call Was Associated With Survival in Patients With Symptoms**

Of 839 patients with SCA and comprehensive assessment of symptoms (mean age, 52.6 years; 75% men), 430 (51%) had warning symptoms (50% of men & 53% of women), mainly chest pain and dyspnea. In most symptomatic patients (93%), symptoms recurred within the 24 hours preceding SCA. Only 81 patients (19%) called emergency medical services (EMS)

to report symptoms before SCA; these persons were more likely to be patients with a history of heart disease ($P$ <0.001) or continuous chest pain ($P$ <0.001). Survival when EMS was called in response to symptoms was 32.1% compared with 6% in those who did not call ($P$ <0.001) (Marijon E et al, *Ann Intern Med* 2016;164:23-29).

**VISION study: Among Patients Undergoing Non-Cardiac Surgery, Pre-Operative Statin Therapy Conferred a Lower Risk of Cardiovascular Outcomes at 1 Month**

Among 15,478 patients (≥45 years) having in-patient non-cardiac surgery, analysis of a matched population of 2845 patients (18.4%) treated with a statin and 4492 (29%) controls, indicated that the pre-operative use of statins was associated with lower risk of the primary outcome, a composite of all-cause mortality, myocardial injury after non-cardiac surgery (MINS), or stroke at 30 days (relative risk - RR, 0.83; $P$=0.007). Statins were also associated with a significant lower risk of all-cause mortality (RR, 0.58; $P$=0.003), cardiovascular mortality (RR, 0.42; $P$=0.004), and MINS (RR, 0.86; $P$=0.02). There were no significant differences in the risk of MI or stroke (Berwanger O et al, *Eur Heart J* 2016; 37:177-185).

**Effect of Timing of Pre-operative Discontinuation of Ticagrelor/Clopidogrel on CABG-Related Major Bleeding: Discontinuation 3 Days (vs 5 Days) Before Surgery did not Increase the Incidence of Major Bleeding Complications with Ticagrelor, but Increased the Risk with Clopidogrel**

Among all acute coronary syndrome patients in Sweden on dual antiplatelet therapy with aspirin and ticagrelor ($n$=1266) or clopidogrel ($n$=978) who underwent CABG, the incidence of major bleeding complications was 38 and 31%, respectively, when ticagrelor/clopidogrel was discontinued <24 h before surgery. Within the ticagrelor group, there was no significant difference between discontinuation 3–5 or >5 d before surgery (odds ratio - OR 0.93, $P$=NS). In contrast, clopidogrel-treated patients had a higher incidence when discontinued 3–5 vs >5 d before surgery (OR 1.71, $P$=0.033). The overall incidence of major bleeding complications was lower with ticagrelor (12.9 vs 17.6%, adjusted OR 0.72, $P$=0.012) (Hansson EC et al, *Eur Heart J* 2016; 37:189-197).

**Significance of ECG Recording in High Intercostal Spaces (HICS) in Patients With Early Repolarization Syndrome (ERS): 16% of the Patients Diagnosed With ERS Under the Previous Criteria were Actually Brugada Syndrome (BS) Patients With Inferolateral ER and a Type 1 Brugada Pattern-ECG Only in HICS**

Among 56 patients showing inferolateral early repolarization (ER) in the standard ECG and spontaneous idiopathic ventricular fibrillation (VF) who underwent drug provocation tests by sodium channel blockade with right precordial ECG ($V_1$–$V_3$) recordings in the 2nd–4th intercostal spaces, and after 18 patients showing type 1 Brugada pattern-ECG in the standard ECG were excluded, 38 patients (34 males, mean age; 40.4±13.6 years) were classified into 4 groups: group A ($n$=6; 16%): patients with ER and type 1 Brugada pattern-ECG only in HICS; group B ($n$=5; 13%): ERS with non-type 1 Brugada pattern-ECG only in HICS; group C ($n$=8; 21%): ERS with non-type 1 Brugada pattern-ECG in the standard ECG; and group D ($n$=19; 50%): ERS only, spontaneously or after drug provocation test. During follow-up of 9.2±4.6 years, the rate of VF recurrence was significantly higher in groups A (4/6:67%), B (4/5:80%), and C (4/8:50%) compared with D (2/19:11%) (A, B, and C vs D, $P$ <0.05) (Kamakura T et al, *Eur Heart J* 2016; 37:630-637).

**EAST-AF Trial: Short-Term Use of Antiarrhythmic Drugs (AAD) for 3 Months Following AF Ablation Reduced Recurrent AF During the Treatment Period, But it did not Lead to Improved Clinical Outcomes at 1 Year / Early Arrhythmia Recurrence was Strongly Associated With Late Arrhythmia Recurrence**

Among 2038 patients who had undergone radiofrequency catheter ablation for paroxysmal, persistent, or long-lasting AF, randomly assigned to either 90-day use of AAD (n=1016) or control (n=1022) group, those assigned to AAD were associated with higher event-free rate from recurrent AF when compared with the control group during the treatment period of 90 days (59 and 52.1%, respectively; hazard ratio - HR 0.84; $P$=0.01). However, there was no significant difference in the 1-year event-free rates (Kaitani K et al, *Eur Heart J* 2016; 37:610-618).

**SEPTAL CRT Study: Septal RV Pacing in CRT is Similar to Apical RV Pacing for LV Reverse Remodelling at 6 Months With no Difference in the Clinical Outcome**

Patients ($n$=263, age=63.4±9.5 years) were randomly assigned to right ventricular septal (RVS) ($n$=131) vs apical (RVA) ($n$=132) pacing. Left ventricular end-systolic volume (LVESV) reduction between baseline and 6 months was not different between the two groups. RVS pacing was not non-inferior to RVA pacing with regard to LVESV reduction (average difference = -4.06 mL; $P$=0.006 with a -20 mL non-inferiority margin). The percentage of 'echo-responders' defined by LVESV reduction >15% between baseline and 6 months was similar in both groups (50%) with no difference in the time to first heart failure hospitalization or death ($P$=NS). Procedural or device-related serious adverse events occurred in 68 patients (RVS=37) with no difference between the two groups ($P$=NS) (Leclercq C et al, *Eur Heart J* 2016; 37:473-483).

**BIOSOLVE II: Implantation of the DREAMS 2G Absorbable Stent in De-Novo Coronary Lesions is Feasible, With Favorable Safety and Performance Outcomes at 6 Months**

In 123 patients with 123 coronary target lesions receiving the novel absorbable stent, at 6 months, mean in-segment late lumen loss was 0.27±0.37 mm, and angiographically discernable vasomotion was documented in 20 (80%) of 25 patients. Intravascular ultrasound showed a preservation of the scaffold area with a low mean neointimal area, and optical coherence tomography did not detect any intraluminal mass. Target lesion failure occurred in 4 (3%) patients: 1 (<1%) died from cardiac death, 1 (<1%) had periprocedural MI, and 2 (2%) patients needed clinically driven target lesion revascularization. No definite or probable scaffold thrombosis was observed (Haude M et al, *Lancet* 2016; 387:31–39).

**Systematic Review and Meta-Analysis: Intensive Blood Pressure (BP) Lowering Provided Greater Vascular Protection Than Standard Regimens**

Among 44,989 participants (19 trials), 2496 major cardiovascular (CV) events were recorded at a mean of 3.8 years. Patients in the more intensive BP-lowering group (mean BP 133/76 mmHg, compared with 140/81 mmHg in the less intensive treatment group) had relative risk (RR) reductions for major CV events (14%), MI (13%), stroke (22%), albuminuria (10%), and retinopathy progression (19%). However, more intensive treatment had no clear effects on heart failure (15%), CV death (9%), total mortality (9%), or end-stage kidney disease (10%). The reduction in major CV events was consistent across patient groups, and additional BP lowering had a benefit even when systolic BP was <140 mmHg. The absolute benefits were greatest in trials in which all enrolled patients had vascular or renal disease, or diabetes. Serious adverse events associated were only reported by 6 trials and had an event rate of 1.2%/year in the intensive vs 0.9% in the less intensive treatment group (RR 1.35). Severe hypotension was more frequent in the more intensive treatment regimen (RR 2.68, p=0.015), but the absolute excess was small (0.3% *vs* 0.1% per person-year for the duration of follow-up) (Xie X et al, *Lancet* 2016; 387:435–443).

**Blood Pressure (BP) Lowering Significantly Reduces Vascular Risk Across Various Baseline BP Levels and Comorbidities / Results Provide Strong Support for Lowering BP to Systolic BPs <130 mmHg and Treating Individuals With a History of Cardiovascular (CV) Disease, Coronary Disease, Stroke, Diabetes, Heart Failure, and Chronic Kidney Disease**

Among 613,815 participants (123 studies) every 10 mmHg reduction in systolic BP significantly reduced the risk of major CV disease events (relative risk - RR 0.80), coronary disease (0.83), stroke (0.73), and heart failure (0.72), which led to a significant 13% reduction in all-cause mortality (0.87). However, the effect on renal failure was not significant (0.95). Similar proportional risk reductions (per 10 mm Hg lower systolic BP) were noted in trials with higher and trials with lower mean baseline systolic BP (all $p_{trend}$ >0.05). There was no clear evidence that proportional risk reductions in major CV disease differed by baseline disease history, except for diabetes and chronic kidney disease, for which smaller, but significant, risk reductions were detected. β blockers were inferior to other drugs for prevention of major CV disease events, stroke, and renal failure. Calcium channel blockers (CCBs) were superior to other drugs for the prevention of stroke. For the prevention of heart failure, CCBs were inferior and diuretics were superior to other drug classes (Ettehad D et al, *Lancet* 2016; 387:957–967).

**TOTAL Trial, 1-Year Follow-Up: Routine Thrombus Aspiration During PCI for STEMI did not Reduce Longer-Term Clinical Outcomes and Might be Associated With an Increase in Stroke**

Among 10,064 patients (5035 thrombectomy/5029 PCI alone), the primary outcome at 1 year occurred in 8% in the thrombectomy group and 8% in the PCI alone group. Cardiovascular death within 1 year occurred in 4% in each group. The key safety outcome, stroke within 1 year, occurred in 1.2% in the thrombectomy group and 0.7% in the PCI alone group (hazard ratio-HR 1.66, p=0·015) (Jolly SS et al, *Lancet* 2016; 387(10014):127-135).

**After Eighty Study: In Patients Aged ≥80 Years With NSTEMI or Unstable Angina, an Invasive is Superior to a Conservative Strategy**

Among patients aged ≥80 years with NSTEMI or unstable angina, at a median of 1.53 years, the primary outcome (MI, need for urgent revascularization, stroke and death) occurred in 93/229 (40.6%) patients in the invasive and 140/228 (61.4%) patients in the conservative group (hazard ratio - HR 0.53, p=0.0001). HRs were 0.52 (p=0.0010) for MI, 0.19 (p=0.0010) for need for urgent revascularization, 0.60 (p=NS) for stroke, and 0.89 (p=NS) for death. The invasive group had 4 (1.7%) major and 23 (10%) minor bleeding complications and the conservative group 4 (1.8%) major & 16 (7%) minor bleeding complications (Tegn N et al, *Lancet* 2016;387:1057-1065).

**CNODES Study: In Patients With Diabetes, Incretin-Based Drugs, Including Dipeptidyl Peptidase 4 (DPP-4) Inhibitors and Glucagon-Like Peptide 1 (GLP-1) Analogues, were not Associated With an Increased Risk of Hospitalization for Heart Failure, as Compared With Commonly Used Combinations of Oral Antidiabetic Drugs**

In cohorts including a total of 1,499,650 patients, with 29,741 hospitalized for heart failure (incidence rate, 9.2 events

per 1000 persons per year), the rate of hospitalization for heart failure did not increase with the use of incretin-based drugs as compared with oral antidiabetic-drug combinations among patients with a history of heart failure (hazard ratio - HR, 0.86) or among those without a history of heart failure (HR, 0.82). The results were similar for DPP-4 inhibitors and GLP-1 analogues (Filion KB et al, *N Engl J Med* 2016; 374:1145-1154).

**First-In-Man Experience with an Implanted Left-To-Right Interatrial Shunt Demonstrates Initial Safety and Early Beneficial Clinical and Hemodynamic Outcomes in Patients with Heart Failure with Reduced Ejection Fraction**

An interatrial shunt was successfully implanted in 10 patients with NYHA class III chronic heart failure with reduced ejection fraction with no device-related or procedural adverse events during follow-up. Transesophageal echocardiography at 1 month showed that all shunts were patent, with no thrombosis or migration. From baseline to 3 month follow-up, improvements in NYHA classification from class III to class II were recorded in 7 (78%) of 9 patients, from class III to class I in 1 (11%) patient, and no change in 1 (11%) patient; p=0·0004); quality of life and 6-minute walk test distance improved. Pulmonary capillary wedge pressure was reduced from a mean of 23 mm Hg at baseline to 17 mm Hg at 3 months (p=0.035), with no changes in right atrial pressure, pulmonary arterial pressure, or pulmonary resistance. No patient was hospitalized for worsening heart failure. One (10%) patient was admitted to hospital with gastrointestinal bleeding at month 1; one (10%) patient died after incessant ventricular tachycardia storm, which led to terminal heart failure 2 months post-procedure (Del Trigo M et al, *Lancet* 2016; 387(10025):1290–1297).

**REDUCe Elevated Left Atrial Pressure in Patients with Heart Failure (REDUCE LAP-HF) Study (Multicenter, Open-Label, Single-Arm, Phase 1 Trial): Transcatheter Implantation of an Interatrial Shunt Device for Heart Failure with Preserved Ejection Fraction (HFPEF) is Feasible, Seems to be Safe, Reduces Left Atrial Pressure during Exercise, and could be a New Strategy for the Management of HFPEF**

A transcatheter interatrial shunt device (IASD, Corvia Medical, Tewkesbury, MA, USA) was implanted in 68 patients >40 years of age with symptoms of HFPEF despite pharmacological therapy, LVEF >40%, and increased pulmonary capillary wedge pressure (PCWP) at rest (>15 mmHg) or during exercise (>25 mmHg). IASD placement was successful in 64 patients and seemed to be safe and well tolerated; no patient had a peri-procedural or major adverse cardiac or cerebrovascular event or need for cardiac surgery for device-related complications during follow-up. At 6 months, 31 (52%) of 60 patients had a reduction in PCWP at rest, 34 (58%) of 59 had a lower PCWP during exertion, and 23 (39%) of 59 fulfilled both these criteria. Mean exercise PCWP was lower at 6 months than at baseline, both at 20 watts workload, despite increased mean exercise duration. Sustained device patency at 6 months was confirmed by left-to-right shunting (Hasenfuss G et al, *Lancet* 2016; 387:1298–1304).

**Important Review and Other Articles**

***2015 ACC/AHA/SCAI Focused Update on Primary PCI for Patients With STEMI*** (Levine GN et al, *J Am Coll Cardiol* 2016;67:1235-1250), Exercise and cardiovascular events (Eijsvogels TMH et al, *J Am Coll Cardiol* 2016;67:316-329), Natriuretic peptide testing in heart failure (Francis GS et al, *J Am Coll Cardiol* 2016;67:330-337), Subcutaneous ICD (Lewis GF & Gold MR, *J Am Coll Cardiol* 2016;67:445-454), Testosterone and cardiovascular disease (Kloner RA et al, *J Am Coll Cardiol* 2016;67:545-557), Pulmonary embolism management (Konstantinides S et al, *J Am Coll Cardiol* 2016;67:976-990), QRS duration vs morphology in CRT (Poole JE et al, *J Am Coll Cardiol* 2016;67:1104-1117), ICD lead failure and management (Swerdlow CD et al, *J Am Coll Cardiol* 2016;67:1358-1368), Surgery for aortic dilatation in bicuspid aortic valves (Hiratzka LF et al, *Circulation* 2016;133:680-686), Acute MI in women (Mehta LS et al, *Circulation 2016;*133: 916-947), Sudden death in the young (Ackerman M et al, *Circulation* 2016;133: 1006-1026), Combined angiotensin receptor antagonism and neprilysin inhibition (Hubers SA & Brown NJ, *Circulation* 2016;133:1115-1124), Statin associated autoimmune myopathy (Mammen AL, *N Engl J Med* 2016;374:664-669), Special Issue on the 2015 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension (*Eur Heart J* 2016 Jan; 37(1)), 2015 ESC Guidelines for the management of ACS without persistent ST-segment elevation (*Eur Heart J* 2016; 37:267-315), TAVI (Hamm CW et al, *Eur Heart J* 2016; 37: 803-810), Catheter ablation of VT (Tanawuttiwat T et al, *Eur Heart J* 2016;37:594-609), Infective endocarditis (Cahill TJ & Prendergast BD, *Lancet* 2016; 387(10021):882–893), Cardiac sarcoidosis (Kusano KF & Satomi K, *Heart* 2016;102:184-190).