

# SNAPSHOT IN CARDIOLOGY

ROBERTO FERRARI, MD, PhD; KIM FOX, MD, FRCP

These articles were taken from the New England Journal of Medicine, The Lancet, and JAMA between January 1, 2018 and December 31, 2018. All research articles on cardiology were included; reviews and guidelines were excluded.

## JANUARY

**Al-Lamee R, Thompson D, Dehbi HM, et al; ORBITA investigators. Percutaneous coronary intervention in stable angina (ORBITA): a double-blind, randomised controlled trial. *Lancet*. 2018;391(10115):31-40.**

The multicenter, randomized ORBITA trial, which analyzed PCI vs placebo for angina relief, showed that, in patients with angina and severe coronary stenosis, percutaneous coronary intervention did not increase exercise time compared with placebo.

**Anand SS, Bosch J, Eikelboom JW, et al; COMPASS Investigators. Rivaroxaban with or without aspirin in patients with stable peripheral or carotid artery disease: an international, randomised, double-blind, placebo-controlled trial. *Lancet*. 2018;391(10117):219-229.**

The COMPASS trial showed that, in patients with peripheral artery disease, low-dose rivaroxaban taken twice a day plus aspirin once a day reduced major adverse cardiovascular and limb events vs aspirin alone. Although major bleeding was increased, fatal or critical organ bleeding was not.

**Connolly SJ, Eikelboom JW, Bosch J, et al; COMPASS Investigators. Rivaroxaban with or without aspirin in patients with stable coronary artery disease: an international, randomised, double-blind, placebo-controlled trial. *Lancet*. 2018;391(10117):205-218.**

The COMPASS trial showed that, in patients with stable coronary artery disease, the addition of rivaroxaban to aspirin lowered major vascular events, but increased major bleeding. Overall, there was also a significant net benefit in favor of rivaroxaban plus aspirin, including a 23% reduction in death.

**Feldman TE, Reardon MJ, Rajagopal V, et al. Effect of mechanically expanded vs self-expanding transcatheter aortic valve replacement on mortality and major adverse clinical events in high-risk patients with aortic stenosis: the REPRISÉ III randomized clinical trial. *JAMA*. 2018;319(1):27-37.**

The REPRISÉ III trial showed that, in high-risk patients with severe, symptomatic aortic stenosis, the use of a mechanically expanded valve was not inferior to a self-expanding valve for the primary safety end point or the primary effectiveness end point.

**Friedman DJ, Piccini JP, Wang T, et al. Association between left atrial appendage occlusion and readmission for thromboembolism among patients with atrial fibrillation undergoing concomitant cardiac surgery. *JAMA*. 2018;319(4):365-374.**

In older patients ( $\geq 65$  years old) with atrial fibrillation undergoing cardiac surgery (ie, coronary artery bypass grafting, mitral valve surgery with or without coronary artery bypass grafting, or aortic valve surgery with or without coronary artery bypass grafting), surgical left atrial appendage occlusion was

associated with a lower risk of readmission for thromboembolism over 3 years compared with no surgical left atrial appendage occlusion.

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**Kwong JC, Schwartz KL, Campitelli MA, et al. Acute myocardial infarction after laboratory-confirmed influenza infection. *N Engl J Med.* 2018;378(4):345-353.**

This self-controlled case-series study showed that, in patients hospitalized for acute myocardial infarction that occurred within 1 year before and 1 year after a positive test for influenza, there was a significant association between respiratory infections, especially influenza, and acute myocardial infarction.

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**Montaigne D, Marechal X, Modine T, et al. Daytime variation of perioperative myocardial injury in cardiac surgery and its prevention by Rev-Erba antagonism: a single-centre propensity-matched cohort study and a randomised study. *Lancet.* 2018;391(10115):59-69.**

In patients with severe aortic stenosis and preserved left ventricular ejection fraction, perioperative myocardial injury was significantly lower in those who underwent isolated aortic valve replacement surgery in the afternoon. An ex-vivo analysis of human myocardium showed transcriptional alterations in circadian gene expression with the nuclear receptor Rev-Erba being highest in the morning, suggesting that Rev-Erba antagonism may be a pharmacological strategy for cardioprotection.

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**Nogueira RG, Jadhav AP, Haussen DC, et al; DAWN Trial Investigators. Thrombectomy 6 to 24 hours after stroke with a mismatch between deficit and infarct. *N Engl J Med.* 2018;378(1):11-21.**

Thrombectomy plus standard care resulted in better 90-day disability outcomes post-treatment in patients with acute stroke who

had been well 6 to 24 hours prior to the stroke and who had a mismatch between clinical deficit and infarct vs standard care alone.

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**Ridker PM, MacFadyen JG, Everett BM, Libby P, Thuren T, Glynn RJ; CANTOS Trial Group. Relationship of C-reactive protein reduction to cardiovascular event reduction following treatment with canakinumab: a secondary analysis from the CANTOS randomised controlled trial. *Lancet.* 2018;391(10118):319-328.**

The CANTOS showed that, in patients with a history of myocardial infarction, reaching a high-sensitivity C-reactive protein concentration <2 mg/L with canakinumab resulted in a 25% reduction in major adverse cardiovascular events and a 31% reduction in both cardiovascular mortality and all-cause mortality, whereas no significant benefit was observed with high-sensitivity C-reactive protein concentrations ≥2 mg/L.

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**Varenne O, Cook S, Sideris G, et al; SENIOR Investigators. Drug-eluting stents in elderly patients with coronary artery disease (SENIOR): a randomised single-blind trial. *Lancet.* 2018;391(10115):41-50.**

The SENIOR trial showed that, among elderly patients (≥75 years old) who underwent primary coronary intervention, the combination of a drug-eluting stent and a short duration of dual antiplatelet therapy is better than the combination of a bare-metal stent and a similar duration of dual antiplatelet therapy regarding the occurrence of all-cause mortality, myocardial infarction, stroke, and ischemia-driven target lesion revascularization.



**MARCH**

**Bath PM, Woodhouse LJ, Appleton JP, et al; TARDIS Investigators. Antiplatelet therapy with aspirin, clopidogrel, and dipyridamole versus clopidogrel alone or aspirin and dipyridamole in patients with acute cerebral ischaemia (TARDIS): a randomised, open-label, phase 3 superiority trial. *Lancet*. 2018;391(10123):850-859.**

The TARDIS trial showed that, among patients with recent cerebral ischemia, the incidence and severity of recurrent stroke or transient ischemic attack did not differ between intensive antiplatelet therapy with three agents and guideline-recommended therapy (ie, aspirin plus dipyridamole or clopidogrel alone). In addition, the intensive therapy resulted in a significantly higher risk of major bleeding.

**Dzadzko V, Clavel MA, Dzadzko M, et al. Outcome and undertreatment of mitral regurgitation: a community cohort study. *Lancet*. 2018;391(10124):960-969.**

This community cohort study showed that, despite the poor outcomes associated with isolated mitral regurgitation, only a minority of affected patients undergo mitral (or any type of cardiac) surgery, even when all means to diagnose and treat the disease are available and accessible.

**Hahn JY, Song YB, Oh JH, et al; SMART-DATE investigators. 6-month versus 12-month or longer dual antiplatelet therapy after percutaneous coronary intervention in patients with acute coronary syndrome (SMART-DATE): a randomised, open-label, non-inferiority trial. *Lancet*. 2018;391(10127):1274-1284.**

The SMART-DATE trial showed that a 6-month duration of dual antiplatelet therapy, compared with 12 months, in patients with acute coronary syndrome who underwent

percutaneous coronary intervention with current-generation drug-eluting stents resulted in an increased risk of myocardial infarction.

**Head SJ, Milojevic M, Daemen J, et al. Mortality after coronary artery bypass grafting versus percutaneous coronary intervention with stenting for coronary artery disease: a pooled analysis of individual patient data. *Lancet*. 2018;391(10124):939-948.**

This systematic review showed that coronary artery bypass grafting resulted in a mortality benefit compared with percutaneous coronary intervention in patients with multivessel disease, particularly those with diabetes and higher coronary complexity, but not in patients with left main disease.

**McManus RJ, Mant J, Franssen M, et al; TASMING4 Investigators. Efficacy of self-monitored blood pressure, with or without telemonitoring, for titration of antihypertensive medication (TASMING4): an unmasked randomised controlled trial. *Lancet*. 2018;391(10124):949-959.**

The TASMING4 trial showed that, in patients with poorly controlled hypertension, the use of self-monitoring, with or without telemonitoring, to titrate antihypertensive medication results in significantly lower blood pressure than titration guided by clinic readings.

## APRIL

**Banegas JR, Ruilope LM, de la Sierra A, et al. Relationship between clinic and ambulatory blood-pressure measurements and mortality. *N Engl J Med.* 2018;378(16):1509-1520.**

An analysis of a registry-based, multicenter, national cohort that included 63 910 adults recruited from 2004 through 2014 in Spain showed that ambulatory blood pressure measurements were a stronger predictor of all-cause and cardiovascular mortality than clinic blood pressure measurements.

**Berwanger O, Santucci EV, de Barros E Silva PGM, et al; SECURE-PCI Investigators. Effect of loading dose of atorvastatin prior to planned percutaneous coronary intervention on major adverse cardiovascular events in acute coronary syndrome: the SECURE-PCI randomized clinical trial. *JAMA.* 2018;319(13):1331-1340.**

The SECURE-PCI trial showed that periprocedural loading doses of atorvastatin did not reduce the rate of 30-day major adverse cardiovascular events in patients with acute coronary syndrome and a planned invasive management with percutaneous coronary intervention.

**McDermott MM, Spring B, Berger JS, et al. Effect of a home-based exercise intervention of wearable technology and telephone coaching on walking performance in peripheral artery disease: the HONOR randomized clinical trial. *JAMA.* 2018;319(16):1665-1676.**

The HONOR trial showed that a home-based exercise program, which involved using wearable activity monitoring and telephone coaching for patients with peripheral artery disease, did not improve walking performance at the 9-month follow-up appointment vs usual care.

**Mehra MR, Goldstein DJ, Uriel N, et al; MOMENTUM 3 Investigators. Two-year outcomes with a magnetically levitated cardiac pump in heart failure. *N Engl J Med.* 2018;378(15):1386-1395.**

The MOMENTUM 3 trial showed that, in patients with advanced heart failure, a fully magnetically levitated centrifugal-flow pump was superior to a mechanical-bearing axial-flow pump with regard to survival free of disabling stroke or reoperation to replace or remove a malfunctioning device.

**Navarese EP, Robinson JG, Kowalewski M, et al. Association between baseline LDL-C level and total and cardiovascular mortality after LDL-C lowering: a systematic review and meta-analysis. *JAMA.* 2018;319(15):1566-1579.**

This meta-analysis showed that patients with a high baseline level of low-density lipoprotein cholesterol (>100 mg/dL) had a greater reduction in the risk of total and cardiovascular mortality when receiving a more intensive therapy to lower low-density lipoprotein cholesterol vs those who received a less intensive therapy.

**Victor RG, Lynch K, Li N, et al. A cluster-randomized trial of blood-pressure reduction in black barbershops. *N Engl J Med.* 2018;378(14):1291-1301.**

Among non-Hispanic black male barbershop patrons with uncontrolled hypertension, health promotion by barbers resulted in larger reductions in blood pressure when coupled with medication management in barbershops by specialty-trained pharmacists.

MAY

**Yu K, Qiu G, Chan KH, et al. Association of solid fuel use with risk of cardiovascular and all-cause mortality in rural China. *JAMA*. 2018;319(13):1351-1361.**

In rural areas of China, higher risks of cardiovascular and all-cause mortality was associated with the use of solid fuels for cooking and heating; however, this risk may be reduced by switching to clean fuels and using ventilation.

**Zhao Q, Zhu Y, Xu Z, et al. Effect of ticagrelor plus aspirin, ticagrelor alone, or aspirin alone on saphenous vein graft patency 1 year after coronary artery bypass grafting: a randomized clinical trial. *JAMA*. 2018;319(16):1677-1686.**

In patients undergoing elective coronary artery bypass grafting, graft patency after 1 year significantly increased in those receiving ticagrelor plus aspirin vs those receiving aspirin alone.

**Zheng SL, Roddick AJ, Aghar-Jaffar R, et al. Association between use of sodium-glucose cotransporter 2 inhibitors, glucagon-like peptide 1 agonists, and dipeptidyl peptidase 4 inhibitors with all-cause mortality in patients with type 2 diabetes: a systematic review and meta-analysis. *JAMA*. 2018;319(15):1580-1591.**

This meta-analysis showed that, in patients with type 2 diabetes, the use of sodium-glucose cotransporter 2 inhibitors or glucagon-like peptide 1 agonists was associated with lower mortality than the use of dipeptidyl peptidase 4 inhibitors.

**Brilakis ES, Edson R, Bhatt DL, et al; DIVA Trial Investigators. Drug-eluting stents versus bare-metal stents in saphenous vein grafts: a double-blind, randomised trial. *Lancet*. 2018;391(10134):1997-2007.**

During a 12-month follow-up of patients undergoing stenting of de-novo saphenous vein bypass graft lesions, no significant differences in outcomes were found between patients receiving drug-eluting stents and those receiving bare-metal stents.

**Gaudino M, Benedetto U, Femes S, et al; RADIAL Investigators. Radial-artery or saphenous-vein grafts in coronary-artery bypass surgery. *N Engl J Med*. 2018;378(22):2069-2077.**

The RADIAL investigators showed that radial-artery grafts for coronary artery bypass grafting procedures resulted in lower rates of adverse cardiac events and a higher rate of patency after a 5-year follow-up period than did saphenous vein grafts.

**McIntyre WF, Um KJ, Alhazzani W, et al. Association of vasopressin plus catecholamine vasopressors vs catecholamines alone with atrial fibrillation in patients with distributive shock: a systematic review and meta-analysis. *JAMA*. 2018;319(18):1889-1900.**

This meta-analysis showed that, in patients with distributive shock, the combination of vasopressin and catecholamine vasopressors was associated with a lower risk of atrial fibrillation compared with catecholamines alone.

**Pylypchuk R, Wells S, Kerr A, et al. Cardiovascular disease risk prediction equations in 400 000 primary care patients in New Zealand: a derivation and validation study. *Lancet*. 2018;391(10133):1897-1907.**

Pooled cohort equations, which are based mainly on old patient cohorts, overestimate the risk of cardiovascular disease in New Zealand, as evidenced by a large prospective cohort study. This study was representative of typical patients in primary care in New Zealand who were recommended for cardiovascular disease risk assessment, showing that most patients are now at a low risk of cardiovascular disease.

**Yao X, Gersh BJ, Holmes DR et al. Association of surgical left atrial appendage occlusion with subsequent stroke and mortality among patients undergoing cardiac surgery. *JAMA*. 2018;319(20):2116-2126.**

Performing surgical occlusion of the left atrial appendage in patients during cardiac surgery (eg, coronary artery bypass graft or valve surgery) reduced the risk of subsequent stroke and all-cause mortality vs patients not undergoing surgical left atrial appendage occlusion during surgery.

**Azizi M, Schmieder RE, Mahfoud F, et al; RADIANCE-HTN Investigators. Endovascular ultrasound renal denervation to treat hypertension (RADIANCE-HTN SOLO): a multicentre, international, single-blind, randomised, sham-controlled trial. *Lancet*. 2018;391(10137):2335-2345.**

The RADIANCE-HTN SOLO trial showed that, compared with a sham procedure, endovascular ultrasound renal denervation reduced ambulatory blood pressure at 2 months in patients with combined systolic-diastolic hypertension in the absence of medications.

**Devereaux PJ, Duceppe E, Guyatt G, et al; MANAGE Investigators. Dabigatran in patients with myocardial injury after non-cardiac surgery (MANAGE): an international, randomised, placebo-controlled trial. *Lancet*. 2018;391(10137):2325-2334.**

The MANAGE trial showed that, in patients who had myocardial injury after noncardiac surgery (MINS), dabigatran 110 mg twice daily lowered the risk of major vascular complications, with no significant increase in major bleeding.

**Estruch R, Ros E, Salas-Salvadó J, et al; PREDIMED Study Investigators. Primary prevention of cardiovascular disease with a Mediterranean diet supplemented with extra-virgin olive oil or nuts. *N Engl J Med*. 2018;378(25):e34.**

The multicenter trial PREDIMED showed that, in people at high cardiovascular risk in Spain, the incidence of major cardiovascular events was lower among those assigned to a Mediterranean diet supplemented with extra-virgin olive oil or nuts than among those assigned to a reduced-fat diet.

**Kandzari DE, Böhm M, Mahfoud F, et al; SPYRAL HTN-ON MED Trial Investigators. Effect of renal denervation on blood pressure in the presence of antihypertensive drugs: 6-month efficacy and safety results from the SPYRAL HTN-ON MED proof-of-concept randomised trial. *Lancet*. 2018;391(10137):2346-2355.**

The SPYRAL HTN-ON MED trial showed that, compared with a sham control, renal denervation in the main renal arteries and branches significantly reduced blood pressure, with no major safety events.

**Selak V, Kerr A, Poppe K, et al. Annual risk of major bleeding among persons without cardiovascular disease not receiving antiplatelet therapy. *JAMA*. 2018;319(24):2507-2520.**

This prospective cohort study determined a baseline bleeding risk estimate in people without cardiovascular disease who were not taking antiplatelet therapy, which could be useful in the decision-making process for the primary prevention of cardiovascular disease.

**Kim JM, Stewart R, Lee YS, et al. Effect of escitalopram vs placebo treatment for depression on long-term cardiac outcomes in patients with acute coronary syndrome: a randomized clinical trial. *JAMA*. 2018;320(4):350-358.**

In patients with recent acute coronary syndrome and depression, a 24-week treatment with escitalopram vs placebo lowered the risk of major adverse cardiac events, ie, a composite of all-cause mortality, myocardial infarction, and percutaneous coronary intervention, after a median of 8.1 years.

**Steinhubl SR, Waalen J, Edwards AM, et al. Effect of a home-based wearable continuous ECG monitoring patch on detection of undiagnosed atrial fibrillation: the mStoPS randomized clinical trial. *JAMA*. 2018;320(2):146-155.**

The mStoPS trial, a direct-to-participant randomized clinical trial showed that, among individuals at high risk for atrial fibrillation, immediate monitoring with a self-applied wearable electrocardiogram patch led to a higher diagnosis rate of atrial fibrillation after 4 months than did delayed monitoring.

**Xaplanteris P, Fournier S, Pijls NHJ, et al; FAME 2 Investigators. Five-year outcomes with PCI guided by fractional flow reserve. *N Engl J Med*. 2018;379(3):250-259.**

In patients with angiographically significant stenoses, ie, patients with at least one hemodynamically significant stenosis (fractional flow reserve [FFR],  $\leq 0.80$ ), FFR-guided percutaneous coronary intervention plus medical therapy significantly lowered the rate of the primary composite end point of death, myocardial infarction, or urgent revascularization at 5 years vs medical therapy alone.

## AUGUST

**Benger JR, Kirby K, Black S, et al. Effect of a strategy of a supraglottic airway device vs tracheal intubation during out-of-hospital cardiac arrest on functional outcome: the AIRWAYS-2 randomized clinical trial. *JAMA*. 2018;320(8):779-791.**

The AIRWAYS-2 trial showed that, among patients with nontraumatic out-of-hospital cardiac arrest, an advanced airway management strategy that used a supraglottic airway device did not result in a favorable functional outcome at 30 days when compared with a tracheal intubation.

**Malhotra A, Dhutia H, Finocchiaro G, et al. Outcomes of cardiac screening in adolescent soccer players. *N Engl J Med*. 2018;379(6):524-534.**

The English Football Association cardiac screening program, which consisted of a health questionnaire, physical examination, electrocardiography, and echocardiography, showed that 0.38% of adolescent soccer players had diseases associated with sudden cardiac death.

**Mente A, O'Donnell M, Rangarajan S, et al. Urinary sodium excretion, blood pressure, cardiovascular disease, and mortality: a community-level prospective epidemiological cohort study. *Lancet*. 2018;392(10146):496-506.**

Data from the PURE study showed that sodium intake was associated with an increase in cardiovascular disease and stroke, but only in communities with an average sodium intake >5 g/day.

**Perkins GD, Ji C, Deakin CD, et al; PARAMEDIC2 Collaborators. A randomized trial of epinephrine in out-of-hospital cardiac arrest. *N Engl J Med*. 2018;379(8):711-721.**

While the use of epinephrine in adults with an out-of-hospital cardiac arrest significantly improved the rate of 30-day survival vs placebo, its use resulted in more survivors having severe neurologic impairment.

**Rawshani A, Rawshani A, Franzén S, et al. Risk factors, mortality, and cardiovascular outcomes in patients with type 2 diabetes. *N Engl J Med*. 2018;379(7):633-644.**

Patients with diabetes have a higher risk of death and cardiovascular outcomes than the general population; however, patients with type 2 diabetes in whom the five risk-factor variables (glycated hemoglobin levels, low-density lipoprotein cholesterol levels, albuminuria, smoking, and blood pressure) were within the target ranges, appeared to have little or no excess risk of death, myocardial infarction, or stroke when compared with the general population.

**Rawshani A, Sattar N, Franzén S, et al. Excess mortality and cardiovascular disease in young adults with type 1 diabetes in relation to age at onset: a nationwide, register-based cohort study. *Lancet*. 2018;392(10146):477-486.**

This register-based cohort study of individuals with type 1 diabetes in Sweden showed that an important determinant of survival and cardiovascular outcomes was the age at the onset of type 1 diabetes, with the highest excess risk occurring in women.

**Rothwell PM, Cook NR, Gaziano JM, et al. Effects of aspirin on risks of vascular events and cancer according to bodyweight and dose: analysis of individual patient data from randomised trials. *Lancet*. 2018;392(10145):387-399.**

Low doses of aspirin (75-100 mg) effectively prevented vascular events in patients who

weighed <70 kg, but not in 80% of men and 50% of women weighing >70 kg. However, high doses of aspirin effectively prevented vascular events in patients weighing ≥70 kg.



**Samieri C, Perier MC, Gaye B, et al. Association of cardiovascular health level in older age with cognitive decline and incident dementia. *JAMA*. 2018;320(7):657-664.**

In older adults, the risk of dementia and the rate of cognitive decline were lower for those with an optimal cardiovascular health level (defined by the American Heart Association as nonsmoking, body mass index <25, regular physical activity, eating fish ≥2 times per week and fruits and vegetables at least 3 times a day, cholesterol <200 mg/dL [untreated], fasting glucose <100 mg/dL [untreated], and blood pressure <120/80 mm Hg [untreated]).



**Sweeting MJ, Masconi KL, Jones E, et al. Analysis of clinical benefit, harms, and cost-effectiveness of screening women for abdominal aortic aneurysm. *Lancet*. 2018;392(10146):487-495.**

While national screening programs reduced deaths from abdominal aortic aneurysm in men and are cost-effective, this analysis shows that an abdominal aortic aneurysm screening program for women, designed to be similar to that used to screen men, is unlikely to be cost-effective.



**Wang HE, Schmicker RH, Daya MR, et al. Effect of a strategy of initial laryngeal tube insertion vs endotracheal intubation on 72-hour survival in adults with out-of-hospital cardiac arrest: a randomized clinical trial. *JAMA*. 2018;320(8):769-778.**

This multicenter, pragmatic, cluster-cross-over clinical trial showed that, among adults with an out-of-hospital cardiac arrest, an initial airway management with a laryngeal tube insertion significantly improved the 72-hour survival rate vs an endotracheal intubation.



**Webster R, Salam A, de Silva HA, et al; TRIUMPH Study Group. Fixed low-dose triple combination antihypertensive medication vs usual care for blood pressure control in patients with mild to moderate hypertension in Sri Lanka: a randomized clinical trial. *JAMA*. 2018;320(6):566-579.**

The TRIUMPH study showed that, among patients with mild-to-moderate hypertension, low-dose triple blood pressure-lowering therapy increased the proportion of patients who achieved their target blood pressure goal vs usual care.

## SEPTEMBER

**Bohula EA, Wiviott SD, McGuire DK, et al; CAMELLIA-TIMI 61 Steering Committee and Investigators. Cardiovascular safety of lorcaserin in overweight or obese patients. *N Engl J Med.* 2018;379(12):1107-1117.**

The CAMELLIA-TIMI 61 trial showed that, in a high-risk population of overweight or obese patients, lorcaserin, a selective serotonin 2C receptor agonist that modulates appetite, facilitated sustained weight loss without causing a higher rate of major cardiovascular events compared with placebo.

**Gaziano JM, Brotons C, Coppolecchia R, et al; ARRIVE Executive Committee. Use of aspirin to reduce risk of initial vascular events in patients at moderate risk of cardiovascular disease (ARRIVE): a randomised, double-blind, placebo-controlled trial. *Lancet.* 2018;392(10152):1036-1046.**

The ARRIVE trial analyzed the effects of aspirin vs placebo on the time to the first occurrence of cardiovascular death, myocardial infarction, unstable angina, stroke, or transient ischemic attack; however, the event rate was much lower than expected, meaning that the role of aspirin in primary prevention among patients at moderate cardiovascular risk could not be addressed.

**Gupta A, Mackay J, Whitehouse A, et al. Long-term mortality after blood pressure-lowering and lipid-lowering treatment in patients with hypertension in the Anglo-Scandinavian Cardiac Outcomes Trial (ASCOT) Legacy study: 16-year follow-up results of a randomized factorial trial. *Lancet.* 2018;392(10153):1127-1137.**

The ASCOT Legacy Study, a 16-year follow-up study of the ASCOT trial, demonstrated long-term beneficial effects on mortality of antihypertensive treatment with a calcium channel blocker-based treatment regimen

and lipid lowering with a statin; patients who received an amlodipine-based treatment had fewer stroke deaths and patients on atorvastatin had fewer cardiovascular deaths more than 10 years later.

**Jeger RV, Farah A, Ohlow MA, et al; BASKET-SMALL 2 Investigators. Drug-coated balloons for small coronary artery disease (BASKET-SMALL 2): an open-label randomised non-inferiority trial. *Lancet.* 2018;392(10150):849-856.**

The BASKET-SMALL 2 trial showed that, in patients with de-novo lesions (<3 mm in diameter) in coronary vessels and an indication for percutaneous coronary intervention, drug-coated balloons are noninferior to drug-eluting stents regarding major adverse cardiovascular events.

**Koehler F, Koehler K, Deckwart O, et al. Efficacy of telemedical interventional management in patients with heart failure (TIM-HF2): a randomised, controlled, parallel-group, unmasked trial. *Lancet.* 2018;392(10152):1047-1057.**

The TIM-HF2 trial showed that a structured remote patient management intervention, when used in a well-defined population of patients with heart failure, could reduce the percentage of days lost due to unplanned cardiovascular hospital admissions and all-cause mortality.

**Lansky A, Wijns W, Xu B, et al; TARGET All Comers Investigators. Targeted therapy with a localised abluminal groove, low-dose sirolimus-eluting, biodegradable polymer coronary stent (TARGET All Comers): a multicentre, open-label, randomised non-inferiority trial. *Lancet.* 2018;392(10153):1117-1126.**



**Pilgrim T, Piccolo R, Heg D, et al. Ultrathin-strut, biodegradable-polymer, sirolimus-eluting stents versus thin-strut, durable-polymer, everolimus-eluting stents for percutaneous coronary revascularisation: 5-year outcomes of the BIOSCIENCE randomised trial. *Lancet*. 2018;392(10149):737-746.**

The BIOSCIENCE trial, a randomized, single-blind, multicenter, noninferiority trial, showed that the 5-year risk of target lesion failure in all-comer patients undergoing a percutaneous coronary intervention was similar between biodegradable-polymer sirolimus-eluting stents and durable-polymer everolimus-eluting stents.

**Shah ASV, Anand A, Strachan FE, et al; High-STEACS Investigators. High-sensitivity troponin in the evaluation of patients with suspected acute coronary syndrome: a stepped-wedge, cluster-randomised controlled trial. *Lancet*. 2018;392(10151):919-928.**

Despite showing that the use of a high-sensitivity cardiac troponin assay in patients admitted to emergency departments with suspected acute coronary syndrome resulted in 17% being reclassified as patients with myocardial injury or infarction, use of the assay did not alter the subsequent incidence of myocardial infarction or cardiovascular death at 1 year.

**Spyropoulos AC, Ageno W, Albers GW, et al; MARINER Investigators. Rivaroxaban for thromboprophylaxis after hospitalization for medical illness. *N Engl J Med*. 2018;379(12):1118-1127.**

The MARINER trial showed that medically ill patients who were at an increased risk for venous thromboembolism who received rivaroxaban for 45 days after hospital discharge did not have a significantly lower risk of symptomatic venous thromboembolism

and death due to venous thromboembolism compared with placebo.

**Valgimigli M, Frigoli E, Leonardi S, et al; MATRIX Investigators. Radial versus femoral access and bivalirudin versus unfractionated heparin in invasively managed patients with acute coronary syndrome (MATRIX): final 1-year results of a multicentre, randomised controlled trial. *Lancet*. 2018;392(10150):835-848.**

The MATRIX program, a program of three nested, randomized, multicenter, open-label, superiority trials in patients with acute coronary syndrome in Italy, the Netherlands, Spain, and Sweden, showed that, in patients with acute coronary syndrome, radial access was associated with lower rates of net adverse clinical events vs femoral access, but not major adverse cardiovascular events at 1 year; however, bivalirudin was not associated with lower rates of major adverse cardiovascular events or net adverse clinical events vs unfractionated heparin.

**Vranckx P, Valgimigli M, Juni P, et al; GLOBAL LEADERS Investigators. Ticagrelor plus aspirin for 1 month, followed by ticagrelor monotherapy for 23 months vs aspirin plus clopidogrel or ticagrelor for 12 months, followed by aspirin monotherapy for 12 months after implantation of a drug-eluting stent: a multicentre, open-label, randomised superiority trial. *Lancet*. 2018;392(10151):940-949.**

The GLOBAL LEADERS trial showed that ticagrelor plus aspirin for 1 month followed by ticagrelor alone for 23 months was not superior to 12 months of standard dual antiplatelet therapy followed by 12 months of aspirin alone in the prevention of all-cause mortality or new Q-wave myocardial infarction 2 years after a percutaneous coronary intervention.

**OCTOBER**

**Gray WA, Keirse K, Soga Y, et al; IMPERIAL investigators. A polymer-coated, paclitaxel-eluting stent (Eluvia) versus a polymer-free, paclitaxel-coated stent (Zilver PTX) for endovascular femoropopliteal intervention (IMPERIAL): a randomised, non-inferiority trial. *Lancet.* 2018;392(10157):1541-1551.**

The IMPERIAL study, in a comparison of the safety and efficacy of the polymer-coated, paclitaxel-eluting Eluvia stent with the polymer-free, paclitaxel-coated Zilver PTX stent for treatment of femoropopliteal artery segment lesions, showed that the Eluvia stent was noninferior to the Zilver PTX stent in terms of primary patency and major adverse events at 12 months.

**Hernandez AF, Green JB, Janmohamed S, et al; Harmony Outcomes Committees and Investigators. Albiglutide and cardiovascular outcomes in patients with type 2 diabetes and cardiovascular disease (Harmony Outcomes): a double-blind, randomised placebo-controlled trial. *Lancet.* 2018;392(10157):1519-1529.**

In patients  $\geq 40$  years old who have type 2 diabetes and cardiovascular disease, a subcutaneous injection of the glucagon-like peptide 1 receptor agonist albiglutide (30 to 50 mg) once a week in addition to their standard care was superior to a matched volume of placebo with respect to major adverse cardiovascular events.

**Howard G, Cushman M, Moy CS, et al. Association of clinical and social factors with excess hypertension risk in black compared with white US adults. *JAMA.* 2018;320(13):1338-1348.**

This prospective cohort study in patients with incident hypertension showed that key factors mediating the racial difference

between black and white adults in the US include a Southern diet score, the dietary ratio of sodium to potassium, and education level. In addition, waist circumference and body mass index also were key factors among women.

**McNeil JJ, Wolfe R, Woods RL, et al; ASPREE Investigator Group. Effect of aspirin on cardiovascular events and bleeding in the healthy elderly. *N Engl J Med.* 2018;379(16):1509-1518.**

In adults  $\geq 70$  years of age or older (or  $\geq 65$  years of age among blacks and Hispanics in the United States) and no cardiovascular disease, dementia, or disability, the use of low-dose aspirin as a primary prevention strategy resulted in a significantly higher risk of major hemorrhage, but it did not significantly lower the risk of cardiovascular disease vs placebo.

**Stone GW, Ellis SG, Gori T, et al; ABSORB IV Investigators. Blinded outcomes and angina assessment of coronary bioresorbable scaffolds: 30-day and 1-year results from the ABSORB IV randomised trial. *Lancet.* 2018;392(10157):1530-1540.**

The ABSORB IV study showed that, in patients with stable coronary artery disease or acute coronary syndromes who were  $\geq 18$  years old, polymeric bioresorbable vascular scaffolds had noninferior 30-day and 1-year rates of target lesion failure and angina vs metallic drug-eluting stents.

**von Birgelen C, Zocca P, Buiten RA, et al. Thin composite wire strut, durable polymer-coated (Resolute Onyx) versus ultrathin cobalt-chromium strut, bioresorbable polymer-coated (Orsiro) drug-eluting stents in**



**Son JS, Choi S, Kim K, et al. Association of blood pressure classification in Korean young adults according to the 2017 American College of Cardiology/American Heart Association guidelines with subsequent cardiovascular disease events. *JAMA*. 2018;320(17):1783-1792.**

In young Korean adults, the presence of stage 1 and stage 2 hypertension, compared with normal blood pressure, was associated with an increased risk of subsequent cardiovascular disease events.



**Thiele H, Akin I, Sandri M, et al; CULPRIT-SHOCK Investigators. One-year outcomes after PCI strategies in cardiogenic shock. *N Engl J Med*. 2018;379(18):1699-1710.**

While the risk of 30-day death or renal replacement therapy was lower in patients with acute myocardial infarction and cardiogenic shock who were assigned culprit-lesion-only percutaneous coronary intervention vs immediate multivessel percutaneous coronary intervention, there were no between-group differences in mortality at the 1-year follow-up.



**van Sloten TT, Tafflet M, Périert MC, et al. Association of change in cardiovascular risk factors with incident cardiovascular events. *JAMA*. 2018;320(17):1793-1804.**

Among a group of participants without cardiovascular disease who received follow-up care over a median of 18.9 years, no consistent relationship was identified between the risk of cardiovascular disease and the direction of change in the composite metric of cardiovascular health as measured using the 7 metrics of the American Heart Association.

**Yano Y, Reis JP, Colangelo LA, Set al. Association of blood pressure classification in young adults using the 2017 American College of Cardiology/American Heart Association Blood pressure guideline with cardiovascular events later in life. *JAMA*. 2018;320(17):1774-1782.**

An analysis of the CARDIA study showed that young adults (<40 years old) with elevated blood pressure, stage 1 hypertension, and stage 2 hypertension had a significantly higher risk of subsequent cardiovascular disease events than did the young adults (<40 years old) with normal blood pressure.

