

Snapshot in Cardiology



SNAPSHOT IN CARDIOLOGY

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These articles were taken from the New England Journal of Medicine, The Lancet, and JAMA between January 1, 2018 and June 30, 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 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 ad-

dition 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 REPRISE III randomized clinical trial. *JAMA.* 2018;319(1):27-37.

The REPRISE 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 (≥ 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.

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.

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.

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.

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.

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.

FEBRUARY

Conrad N, Judge A, Tran J, et al. Temporal trends and patterns in heart failure incidence: a population-based study of 4 million individuals. *Lancet*. 2018;391(10120):572-580.

This population-based study showed that, from 2002 to 2014, despite seeing a decrease in the incidence of heart failure, the estimated absolute number of individuals with newly diagnosed heart failure in the UK increased, as did the estimated absolute number of prevalent heart failure cases. In addition, socioeconomic disparities were observed for heart failure incidence and age at onset.

de Winter RJ, Katagiri Y, Asano T, et al. A sirolimus-eluting bioabsorbable polymer-coated stent (MiStent) versus an everolimus-eluting durable polymer stent (Xience) after percutaneous coronary intervention (DESSOLVE III): a randomised, single-blind, multi-centre, non-inferiority, phase 3 trial. *Lancet*. 2018;391(10119):431-440.

The DESSOLVE III trial showed that MiStent, a sirolimus-eluting bioabsorbable polymer stent, was noninferior to the everolimus-eluting durable polymer stent for a device-oriented composite clinical end point at 12 months in an all-comer population.

Huffman MD, Mohanan PP, Devarajan R, et al; ACS QUIK Investigators. Effect of a quality improvement intervention on clinical outcomes in patients in India with acute myocardial infarction: the ACS QUIK randomized clinical trial. *JAMA*. 2018;319(6):567-578.

The ACS QUIK trial showed that, in patients with acute myocardial infarction in Kerala, India, the use of a quality improvement intervention, which included audit and feedback, checklists, patient education

materials, and links to emergency cardiovascular care and quality improvement training, did not decrease the major adverse cardiovascular events at 30 days compared with usual care.

Marrouche NF, Brachmann J, Andresen D, et al; CASTLE-AF Investigators. Catheter ablation for atrial fibrillation with heart failure. *N Engl J Med*. 2018;378(5):417-427.

The CASTLE-AF trial showed that treating atrial fibrillation in patients with heart failure using catheter ablation resulted in a significantly lower rate of the composite end point of death from any cause or hospitalization for worsening heart failure than in those receiving medical therapy.

Weisbord SD, Gallagher M, Jneid H, et al; PRESERVE Trial Group. Outcomes after angiography with sodium bicarbonate and acetylcysteine. *N Engl J Med*. 2018;378(7):603-614.

The PRESERVE trial showed that, among patients at high risk for renal complications who were undergoing angiography, there was no benefit of intravenous sodium bicarbonate over intravenous sodium chloride or of oral acetylcysteine over placebo for the prevention of death, the need for dialysis, or persistent decline in kidney function at 90 days or for the prevention of contrast-associated acute kidney injury.

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 in patients with acute coronary syndrome who underwent percutaneous coronary interven-

tion 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; TASMINH4 Investigators. Efficacy of self-monitored blood pressure, with or without telemonitoring, for titration of antihypertensive medication (TASMINH4): an unmasked randomised controlled trial. *Lancet*. 2018;391(10124):949-959.

The TASMINH4 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 63910 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, Fremes 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.

JUNE

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 110mg 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. ■