

# Cardiology Practice Review™

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Issue 16 - 2022

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## Abbreviations used in this review:

**AHA** = American Heart Association  
**EULAR** = European Alliance of Associations for Rheumatology  
**HFrEF** = heart failure with reduced ejection fraction  
**RMD** = rheumatic and musculoskeletal disease  
**SCAI** = Society for Cardiovascular Angiography and Interventions  
**USPSTF** = US Preventive Services Task Force

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## Welcome to the 16<sup>th</sup> issue of Cardiology Practice Review.

This Review covers news and issues relevant to clinical practice in cardiology. It will bring you the latest updates, both locally and from around the globe, in relation to topics such as new and updated treatment guidelines, changes to medicines reimbursement and licensing, educational, medicolegal issues, professional body news and more. And finally, on the back cover you will find our COVID-19 resources for Cardiologists and a summary of upcoming local and international educational opportunities including workshops, webinars and conferences.

We hope you enjoy this Research Review publication and look forward to hearing your comments and feedback.

Kind Regards,

**Dr Janette Tenne**

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## Clinical Practice

### A systematic review and network meta-analysis of pharmacological treatment of HFrEF

This was a systematic review and network meta-analysis of randomised controlled trials for pharmacological therapy in heart failure with reduced ejection fraction (HFrEF) to estimate and compare the treatment benefit of various combinations of HFrEF drugs.

Overall, 75 RCTs published between January 1987 and January 2020 were included with 95,444 participants on treatments that included ACE inhibitors, ARBs, beta blockers, mineralocorticoid receptor antagonists (MRAs), digoxin, hydralazine–isosorbide dinitrate, ivabradine, angiotensin receptor–neprilysin inhibitors (ARNIs), sodium glucose cotransporter-2 (SGLT2) inhibitors, vericiguat, and omecamtiv–mecarbil.

A combination of ARNIs, beta blockers, MRAs, and SGLT2 inhibitors was most effective in reducing all-cause death (HR 0.39). This combination was estimated to add 5 years of life after age 70 compared with no treatment. The combination of ARNIs, beta blockers, MRAs, and vericiguat had a HR of 0.41, followed by ARNIs, beta blockers, and MRAs with HR of 0.44.

Results were similar for the composite outcome of cardiovascular death or first hospitalisation for HF (HR 0.36 for ARNIs, beta blockers, MRAs, and SGLT2 inhibitors; HR 0.44 for ARNIs, beta blockers, MRAs, and omecamtiv–mecarbil; and HR 0.43 for ARNIs, beta blockers, MRAs, and vericiguat).

<https://tinyurl.com/mvycsrwr>

### Penicillin reactions in patients with severe rheumatic heart disease: A presidential advisory from the American Heart Association

For patients with rheumatic heart disease (RHD) at increased risk for adverse reactions to intramuscular benzathine penicillin G (BPG), the risk of such treatment may outweigh the benefit, according to an advisory published by the American Heart Association (AHA).

While secondary antibiotic prophylaxis with regular intramuscular BPG is the standard RHD management, the AHA issued an advisory relating to concerns that patients with RHD with severe valvular heart disease may experience fatal cardiovascular compromise following BPG injections.

The authors of the paper categorised patients as low- or elevated-risk based on symptoms and the severity of underlying heart disease. Patients with severe mitral stenosis, severe aortic stenosis, and severe aortic insufficiency were classed as patients with elevated risk, along with patients who had decreased left ventricular systolic dysfunction and those with severe symptoms. For these patients, the risk for an adverse reaction to BPG, in particular cardiovascular compromise, may outweigh the benefit. Prescription of oral antibiotics, preferably penicillin, should be strongly considered in patients at increased risk. Furthermore, vasovagal risk reduction strategies should be undertaken in all patients with RHD receiving BPG.

All low-risk patients without a history of penicillin allergy or anaphylaxis should be prescribed BPG for secondary antibiotic prophylaxis, as recommended by current guidelines.

<https://tinyurl.com/2c2apnwt>



## SCAI SHOCK stage classification expert consensus update

The Society for Cardiovascular Angiography and Interventions (SCAI) has refined its cardiogenic shock classification system based on the literature and clinician feedback from real-world experience.

The refined classification system maintains the five-stage pyramid of cardiogenic shock, starting with 'at risk' and moving through 'beginning', 'classic', 'deteriorating', and 'extremis' but now includes levels of severity within each stage and pathways by which patients progress or recover.

According to the update, 'progression across the SCAI shock stage continuum is a dynamic process, incorporating new information as available and patient trajectories are important both for communication among clinicians and for decision-making regarding the next level of care and therapeutics'.

The update includes a streamlined table incorporating commonly seen variables, based on data from validation studies and clinician experience.

More clarity is provided on cardiac arrest as a risk modifier, which now excludes very brief episodes with rapid response to defibrillation and includes only those patients who have impaired mental status with unknown neurologic recovery status after cardiopulmonary resuscitation.

Lactate level and thresholds have been highlighted to detect hypoperfusion but may be dissociated from haemodynamics in cases such as chronic heart failure.

Furthermore, patients may have other manifestations of end-organ hypoperfusion with a normal lactate level, and there are also important causes of an elevated lactate level other than shock.

The update suggests a three-axis model of cardiogenic shock evaluation and prognostication that integrates shock severity, clinical phenotype and risk modifiers as separate elements that should be applied to individualise patient management.

The update also highlights the trajectory of the patient with cardiogenic shock through hospitalisation, including a 'hub and spoke' model for transfer of higher-risk patients including those with a deteriorating SCAI shock stage.

The authors say that the revised SCAI SHOCK stage classification system will improve both clinical care and cardiogenic shock trial design.

This statement has been endorsed by the American College of Cardiology, American College of Emergency Physicians, American Heart Association, European Society of Cardiology Association for Acute Cardiovascular Care, International Society for Heart and Lung Transplantation, Society of Critical Care Medicine, and Society of Thoracic Surgeons.

<https://tinyurl.com/56k5wmbz>

## USPSTF draft recommendation statement: Statin use for the primary prevention of cardiovascular disease in adults

The US Preventive Services Task Force (USPSTF) recommends statins for the primary prevention of cardiovascular disease for adults aged 40 to 75 years who have cardiovascular risk factors, with the strength of recommendation varying with cardiovascular event risk. These recommendations form the basis of a draft recommendation statement published in February.

A review found that statin therapy was associated with a reduced risk for all-cause mortality, stroke, myocardial infarction, and composite cardiovascular outcomes (RRs 0.92, 0.78, 0.67, and 0.72, respectively). The estimate for cardiovascular mortality was not statistically significant. The relative benefits were consistent in subgroups, including those with cardiovascular risk factors without marked dyslipidaemia. For older individuals, data were not as clear. Statin therapy was not significantly associated with increased risks for serious adverse events, myalgia, liver-related harms, or diabetes.

Based on these findings, the USPSTF recommends statins for primary prevention of cardiovascular disease for adults aged 40 to 75 years with one or more cardiovascular disease risk factors (dyslipidaemia, diabetes, hypertension, or smoking) and with an estimated 10-year risk for a cardiovascular event of 10% or greater. For adults aged 40 to 75 years with one or more cardiovascular disease risk factors and with an estimated 10-year risk for a cardiovascular event of 7.5-10%, the USPSTF recommends that clinicians selectively offer statins for primary prevention. The likelihood of benefit is smaller in this group than in individuals with a 10-year risk of 10% or greater. The evidence is currently insufficient for assessing the balance of benefits and harms of statin initiation for primary prevention of cardiovascular disease and mortality in adults aged 76 years or older.

<https://tinyurl.com/yck8jr3f>

<https://tinyurl.com/4s59jz9k>

## EULAR recommendations for cardiovascular risk management in rheumatic and musculoskeletal diseases

New recommendations from the European Alliance of Associations for Rheumatology (EULAR) provide advice for cardiovascular risk management in various rheumatic and musculoskeletal diseases (RMDs), many of which can lead to an increased possibility of cardiovascular disease.

A task force was convened to develop best practices for preventing cardiovascular disease in patients with gout, vasculitis, systemic sclerosis, myositis, mixed connective tissue disease, Sjögren syndrome, systemic lupus erythematosus, and antiphospholipid syndrome.

The cardiovascular risk management of patients with rheumatoid arthritis, ankylosing spondylitis, and psoriatic arthritis were described in previous EULAR recommendations.

The task force included 20 members from 11 European countries. One group of task force members conducted a systematic literature review of 105 articles on gout, vasculitis, systemic sclerosis, myositis, mixed connective tissue disease, and Sjögren syndrome, and another group evaluated 75 articles on systemic lupus erythematosus and antiphospholipid syndrome. Together, they agreed on four overarching principles:

1. Clinicians should be aware of increased cardiovascular risk in patients with RMDs, with disease reduction likely decreasing risk.
2. Rheumatologists, alongside other healthcare providers, are responsible for their patients' cardiovascular risk assessment and management.
3. Screening for cardiovascular risk should be performed regularly in all patients with RMDs, with an emphasis on risk factors such as smoking and blood pressure management.
4. Patient education and counselling on cardiovascular risk, including key lifestyle modifications, is important for RMD patients.

Specific recommendations for gout, vasculitis, systemic sclerosis, myositis, mixed connective tissue disease, and Sjögren syndrome include using existing cardiovascular prediction tools, with the European Vasculitis Society model suggested to supplement the Framingham Risk Score for patients with anti-neutrophil cytoplasmic antibody-associated vasculitis. Following the same blood pressure and lipid management strategies that are used among the general population is also suggested. It is also recommended that patients with gout should avoid diuretics and patients with systemic sclerosis should avoid beta-blockers.

Recommendations for systemic lupus erythematosus and antiphospholipid syndrome include carefully assessing traditional cardiovascular risk factors in all patients, following usual blood pressure management guidelines in patients with antiphospholipid syndrome, and using a blood pressure target of less than 130/80 mm Hg in patients with systemic lupus erythematosus. Patients with systemic lupus erythematosus should receive the lowest possible dose of glucocorticoids, along with hydroxychloroquine (unless contraindicated) and possibly preventive low-dose aspirin.

Regarding the future, the task force highlighted a number of areas where additional effort is needed, such as identifying patient subgroups with increased cardiovascular risk. This may include patients with a longer disease duration or more flare-ups, older patients, and those with certain disease characteristics such as antiphospholipid positivity in systemic lupus erythematosus.

<https://tinyurl.com/yuy8fknt>

## Clinical applications of cardiac computed tomography

This consensus document endorsed by the European Association of Cardiovascular Imaging provides a summary of the current evidence and indications for cardiac CT as a pivotal diagnostic test.

Coronary calcium scoring detects the presence of subclinical atherosclerosis in coronary arteries beyond conventional clinical cardiovascular risk scores and offers a surrogate for the total coronary plaque volume and the burden of less stable plaque types. Coronary CT angiography has increasing applications in acute and chronic coronary syndromes, identifying both obstructive and nonobstructive coronary stenoses. It is now recommended as a first-line diagnostic test for the evaluation of patients with atypical and typical angina symptoms. However, irregular heart rate, extensive calcifications, significant obesity, and inability to cooperate with breath-hold commands have been linked to decreased diagnostic accuracy.

Coronary CT angiography is also able to assess patients presenting with acute chest pain in assessing graft patency. Its role remains controversial for the evaluation of coronary stents, especially if stent diameter is <3mm.

<https://tinyurl.com/3tvxrarj>

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**References:** 1. Fluzone HD QIV Approved Product Information, 7 December 2021. 2. DiazGranados CA *et al.* *N Engl J Med* 2014;371:635–45. 3. DiazGranados CA *et al.* *Vaccine* 2015;33:4988–4993.

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## News in Brief

### Myocarditis cases reported after mRNA-based COVID-19 vaccination in the US from December 2020 to August 2021

This report described cases of myocarditis after mRNA-based COVID-19 vaccination in the US. Cases reported to the Vaccine Adverse Event Reporting System (VAERS) between December 2020 and August 2021 in individuals aged >12 years were evaluated. Among 192,405,448 individuals receiving a total of 354,100,845 mRNA-based COVID-19 vaccines (Pfizer-BioNTech or Moderna) during the study period, 1626 (0.005%) met the case definition of myocarditis. Of the individuals with myocarditis, median age was 21 years and median time to symptom onset was 2 days. Males comprised 82% of cases, and most cases occurred after the second vaccination dose. NSAIDs were the most common treatment (87%), and approximately 96% of cases were hospitalised.

<https://tinyurl.com/5y22yp2k>

### Clinically suspected myocarditis temporally related to COVID-19 vaccination in adolescents and young adults

This study evaluated suspected myocarditis cases after COVID-19 vaccination in individuals aged <21 years. 139 adolescents and young adults with 140 episodes of suspected myocarditis (49 confirmed, 91 probable) within 30 days of COVID-19 vaccination in Canada and the US were reviewed. 90.6% of patients were male, and median age was 15.8 years. 97.8% of suspected myocarditis cases occurred after an mRNA-based vaccine (94.2% after the Pfizer-BioNTech vaccine), and 91.4% of cases occurred after the second dose. Symptoms started a median 2 days after vaccination, and the most common symptom was chest pain (99.3%). Treatments included NSAIDs (81.3%), IV immunoglobulin (21.6%), glucocorticoids (21.6%), and colchicine (7.9%). 26 patients (18.7%) required treatment in an intensive care unit, but none died. Median hospital stay was 2 days. All patients had elevated troponin I or T, 69.8% had abnormal ECGs and arrhythmias, and 18.7% had LV ejection fraction <55% on ECG.

<https://tinyurl.com/3ebyveuh>

### Association between weight change and incidence of cardiovascular disease events and mortality among adults with type 2 diabetes

This was a systematic review of 14 observational studies of behavioural (nonsurgical and nonpharmacological) bodyweight changes and CV disease events among adults with type 2 diabetes, and three trials of behavioural interventions targeting weight loss; the risk of bias was high in three studies and moderate in most of the rest. Compared with no change in bodyweight gain, weight gain increased the likelihoods of CV disease events (HRs 1.13–1.63) and all-cause mortality (HRs 1.26–1.57). Unintentional weight loss was associated with an increased risk of all-cause mortality, whereas associations with intentional weight loss were not clear. Moreover, behavioural interventions targeting weight loss had no significant impact on the risk of CV disease events (pooled HR 0.95 [95% CI 0.71, 1.27]).

<https://tinyurl.com/2p8uskvm>

### Heart disease and stroke statistics – 2022 update: A report from the American Heart Association

Cardiovascular disease and its risk factors continue to produce immense health and economic burdens. Findings from this 2022 report included increasing death attributable to high blood pressure and a rising prevalence and severity of obesity. The average annual direct and indirect cost of CVD in the US totalled an estimated \$378 billion.

<https://tinyurl.com/463a68mm>

## COVID-19 Resources for Cardiologists

CSANZ <https://tinyurl.com/y3xp2729>

ACC <https://tinyurl.com/y68aud3a>

ESC <https://tinyurl.com/wn3fst5>

## Conferences, Workshops and CPD

Please click on the links below for upcoming local and international Cardiology meetings, workshops and CPD.

ACRA <https://tinyurl.com/y4yj8xb5>

CSANZ <https://tinyurl.com/3mwt5tr>

Cardiac Skills Australia <https://tinyurl.com/zkzlelb>

Heart Foundation <https://tinyurl.com/y34smdoz>

Australian Centre for Heart Health <https://tinyurl.com/e2yjcreu>

ACC <https://tinyurl.com/y2khytpz>

AHA <https://tinyurl.com/zajc9a7>

ESC Congresses and Events <https://tinyurl.com/y6ko68yf>

ESC Education <https://tinyurl.com/y3zkip3o>

## Research Review Publications

### Acute Coronary Syndrome Research Review with Professor John French

<http://tinyurl.com/gos7bat>

### Atrial Fibrillation Research Review

with Dr Andre Catanchin

<http://tinyurl.com/gpvl4dv>

### Cardiology Research Review

with Associate Professor John Amerena

<http://tinyurl.com/gpxu6bl>

### Heart Failure Research Review

with Professor Peter Macdonald and Dr John Atherton

<http://tinyurl.com/hxrsrv6>

### Interventional Cardiology Research Review

with Conjoint Professor Craig Juergens

<http://tinyurl.com/h3h3wcp>

### Lipids Year in Review 2021

<https://tinyurl.com/3urffth4>

### Study Review – Thromboembolism, bleeding, and vascular death in nonvalvular AF

<https://tinyurl.com/dcfckd3>

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