

Cardiology Practice Review™

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Abbreviations used in this issue:

ACC = American College of Cardiology; AHA = American Heart Association;
CSANZ = Cardiac Society of Australia and New Zealand;
ESC = European Society of Cardiology;
PBS = Pharmaceutical Benefits Scheme.

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Welcome to the 28th 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, 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

Editor

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Clinical Practice

Comparison of questionnaire and performance-based physical frailty scales to predict survival and health-related quality of life in patients with heart failure

Physical frailty is highly prevalent in older adults with heart failure (HF) but currently there is uncertainty in clinical practice on how to measure frailty. The aim of this prospective cohort study, which recruited a total of 215 patients (mean age 77.6 years) from four HF clinics, was to compare the prognostic value of three physical frailty scales in ambulatory patients with HF: the Short Physical Performance Battery (SPPB); strength, assistance with walking, rising from a chair, climbing stairs, and falls (SARC-F); and Fried, all of which are readily applied in outpatient clinical settings.

Each of the three frailty scales was demonstrated to be independently associated with death or hospitalisation at 3 months, with adjusted odds ratios of 1.67 for SPPB, 1.60 for Fried, and 1.55 for SARC-F, as well as being independently associated with worsening health-related quality of life measured using the 36-Item Short Form survey questionnaire.

The SPPB, SARC-F scale, and Fried scale were found to have a similar prognostic value in ambulatory patients with HF. Given that they can be conducted in less than 5 minutes in a clinical setting, these scales are helpful prognostic tools in HF patients who are clinically stable and may be used, depending on the time and personnel available to perform them, in a given clinical environment. In situations when real-time resources are constrained, the SARC-F scale is easily administered by telephone interview at a later time.

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

Inflammation and cholesterol as predictors of cardiovascular events among patients receiving statin therapy: a collaborative analysis of three randomised trials

Inflammation (assessed by high-sensitivity C-reactive protein [CRP] levels) and hyperlipidaemia (assessed by low-density lipoprotein cholesterol [LDLC] levels) contribute with similar importance to atherothrombotic disease risk. However, the relative contributions of inflammation and hyperlipidaemia to the risk of future cardiovascular events might change during treatment with intensive statin therapy, which has implications for the selection of adjunctive cardiovascular therapeutic agents.

These researchers assessed the relative importance of CRP and LDLC levels as determinants of risk for major adverse cardiovascular events, cardiovascular death, and all-cause-death in patients receiving statins. They conducted a collaborative analysis of patients either with or at high risk of atherosclerotic disease, who received contemporary statins during participation in three large multinational randomised trials. A total of 31,245 patients from the PROMINENT (n=9,988), REDUCE-IT (n=8,179), and STRENGTH (n=13,078) trials were included in the analysis.

Residual inflammatory risk was significantly associated with incident major adverse cardiovascular events (adjusted HR 1.31; $p < 0.0001$), cardiovascular mortality (2.68; $p < 0.0001$), and all-cause mortality (2.42; $p < 0.0001$). In contrast, the association of residual cholesterol risk with major adverse cardiovascular events was neutral (1.07; $p = 0.11$) and of low magnitude for cardiovascular death (1.27; $p = 0.0086$) and all-cause death (1.16; $p = 0.025$).

Hence, in patients receiving statins, residual inflammatory risk was a stronger predictor for risk of future cardiovascular events and death than residual cholesterol. These data have implications for the selection of adjunctive inflammation-inhibiting therapies beyond statins to further lower the risk of atherosclerotic disease, such as the combined use of aggressive lipid-lowering and inflammation-inhibiting therapies.

<https://tinyurl.com/3p4s8ya4>

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Association of home-based cardiac rehabilitation with lower mortality in patients with cardiovascular disease: results from the veterans' health administration healthy heart programme

Although home-based cardiac rehabilitation (HBCR) and traditional facility-based cardiac rehabilitation (CR) programmes have similar effects on mortality in clinical trials, the effect of HBCR on mortality in clinical practice settings is less clear. To compare mortality rates in HBCR participants with those of non-participants, these researchers evaluated all patients who were referred to outpatient CR at a veterans administration centre. HBCR involved up to nine telephone coaching and motivational interviewing sessions over 12 weeks. Of the 1,120 patients who were referred, 490 (44%) participated in HBCR. During a median follow-up of 4.2 years, 185 patients (17%) died with mortality being lower among the 490 HBCR participants than among the 630 non-participants (12% versus 20%; $p < 0.01$). After adjustment for patient demographics and comorbid conditions, the hazard of mortality remained 36% lower among HBCR participants than among non-participants (HR 0.64; $p = 0.01$). These findings suggest that HBCR may benefit patients who are unable to attend traditional CR programmes.

<https://tinyurl.com/dc3fdc5s>

New insertable cardiac monitors show high diagnostic yield and good safety profile in real-world clinical practice: results from the international prospective observational SMART Registry

Insertable cardiac monitors (ICMs) are used for long-term monitoring of patients with unexplained syncope or palpitations. They are also used for detection of bradycardia, ventricular tachycardia, and/or atrial fibrillation (AF). This study presents new clinical evidence on the favourable safety profile, high detection yield, and clinical value of implantable loop recorders for the monitoring of cardiac arrhythmias.

The SMART Registry is an international, prospective, observational study in which the safety and clinical value associated with a next-generation ICM featuring a new remote monitoring system based on smartphone patient applications was evaluated. Next-generation ICMs are small, minimally-invasive, equipped with specialised detection algorithms, and allow patients to send diagnostics data and to activate the recording of the cardiac rhythm using smartphone applications and Bluetooth technology for efficient clinician remote review.

In a total of 1,400 enrolled patients, ICM indications included syncope (49.1%), AF (18.8%), unexplained palpitations (13.6%), risk of ventricular arrhythmia (6.6%), and cryptogenic stroke (6.0%). Freedom from serious adverse device- and procedure-related events (SADEs) at 1-month post-insertion procedure (primary endpoint) was 99.4%. In only 6 months of follow-up, the ICM detected true cardiac arrhythmias in 45.7% of patients and resulted in clinical interventions in a meaningful proportion of patients. Two particularly notable findings were a pacemaker implant being performed after bradycardia detection in 8.9% of subjects who received an ICM for syncope and oral anticoagulation therapy being indicated after device-detected AF in 15.7% of subjects with cryptogenic stroke. The clinical value of the cardiac monitoring strategy was confirmed by the observation that a new clinical diagnosis was obtained in 27.1% for all patients, 29.9% for syncope, 25.6% for AF, and 20.9% for cryptogenic stroke patients. Device-related or procedure-related adverse events occurred in only 0.7% of patients at 1-month post-implant. Patient-reported experience measurements showed that 78.2% of subjects were satisfied with the remote monitoring patient app.

<https://tinyurl.com/3zrpu4jw>

Coordinated care to optimise cardiovascular preventive therapies in type 2 diabetes: a randomised clinical trial

In clinical practice, evidence-based therapies to lower atherosclerotic cardiovascular disease risk in adults with type 2 diabetes are generally underused. This cluster randomised clinical trial of 43 cardiology clinics across the US tried to answer the question of whether a coordinated intervention of assessment, education, and feedback could increase prescribing of three evidence-based therapies among adults with type 2 diabetes and atherosclerotic cardiovascular disease. The three therapies were high-intensity statins, angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, and sodium-glucose cotransporter 2 inhibitors and/or glucagon-like peptide 1 receptor agonists.

Of a total of 1,049 participants, 459 were enrolled at 20 intervention clinics and 590 were enrolled at 23 usual care clinics. At the last follow-up visit (12 months for 97.3% of participants), those in the intervention group were more likely to be prescribed all three therapies (173/457 [37.9%]) than those in the usual care group (85/588 [14.5%]), which is a difference of 23.4% (aOR 4.38; $p < 0.001$). Participants in the intervention group were also more likely to be prescribed each of the three therapies. The intervention was not associated with changes in atherosclerotic cardiovascular disease risk factors. A composite outcome of all-cause death or hospitalisation for myocardial infarction, stroke, decompensated heart failure, or urgent revascularisation occurred in 23/457 participants (5%) in the intervention group versus 40/588 participants (6.8%) in the usual care group (aHR 0.79).

Hence, the results of the study confirmed that a coordinated, multifaceted intervention increased prescription of three groups of evidence-based therapies in adults with type 2 diabetes and atherosclerotic cardiovascular disease.

<https://tinyurl.com/5cntz6d6>

Paediatric heart failure – understanding the pathophysiology and the current role of cardiac biomarkers in clinical practice

Paediatric heart failure is a complex multifactorial condition for which use of cardiac biomarkers has remained mostly scientific due to differences in the underlying mechanism of cardiac dysfunction in children compared with adults and influence of age affecting the assay levels.

This comprehensive review evaluated the current biomedical literature on paediatric heart failure caused by congenital heart disease (CHD) and cardiomyopathy and considers the available evidence for cardiac biomarkers in this condition.

The literature did not reveal a biomarker that is useful in diagnosing and monitoring heart failure in all children with heart failure. The published evidence suggests that NT-proBNP correlates closely with symptoms of heart failure and ventricular dysfunction in children. However, because a range of diagnostic NT-proBNP cut-off values in this patient group is described in the literature, the use of NT-proBNP as a screening tool requires caution. Of the other potential biomarkers reviewed, none were consistently superior to NT-proBNP.

<https://tinyurl.com/3kb4cjz9>

Supervised exercise training for chronic heart failure with preserved ejection fraction: a scientific statement from the American Heart Association and American College of Cardiology

Heart failure with preserved ejection fraction (HFpEF) is one of the most prevalent forms of heart failure. Its prevalence is increasing due to aging of the population and the growing prevalence of risk factors such as obesity and diabetes. At the same time, clinical outcomes are worsening. Improved management of the large, suboptimally-treated HFpEF patient population is an urgent unmet need.

While most trials of pharmacotherapies for HFpEF have yielded neutral primary outcomes, trials of exercise-based interventions have consistently demonstrated substantial and clinically-meaningful improvements in symptoms, objectively-determined exercise capacity, and quality of life, which may be attributable, at least in part, to the pleiotropic effects of exercise.

This AHA/ACC scientific statement assesses currently available biomedical literature on the effects of exercise-based therapies for chronic stable HFpEF, possible mechanisms for improvement of exercise capacity and symptoms, and how these data compare with exercise therapy for other cardiovascular conditions. In particular, the literature indicates a comparable or larger magnitude of improvement in exercise capacity from supervised exercise training in patients with chronic HFpEF than in those with heart failure with reduced ejection fraction. Some of the topics covered include assessment and quantitation of exercise intolerance in HFpEF, critical analysis of data from aerobic exercise training trials in chronic HFpEF, mechanisms of exercise intolerance in chronic HFpEF and benefits from exercise training, current applications of exercise-based therapies for HFpEF and comparison with other conditions, and implementation of current knowledge, existing gaps, and future research directions.

To provide guidance for future research, the authors highlight gaps in implementation of exercise-based therapies for patients with HFpEF, including exercise setting, training modalities, combinations with other strategies such as diet and medications, long-term adherence, incorporation of more accessible delivery methods, and management of recently hospitalised patients.

<https://tinyurl.com/y27jh5sy>

Regulatory News

PBAC recommendations

- Existing listing of empagliflozin extended to include a General Schedule Authority Required (STREAMLINED) listing for the treatment of chronic heart failure in patients with a left ventricular ejection fraction $>40\%$ but at present empagliflozin is not reimbursed for this indication and can only be accessed through a patient familiarisation programme for patients with HFpEF.
- Patient eligibility for PBS nirmatrelvir and ritonavir to include people aged 60–69 years with mild-to-moderate COVID-19 and one additional risk factor.

<https://tinyurl.com/2h7cpy36>

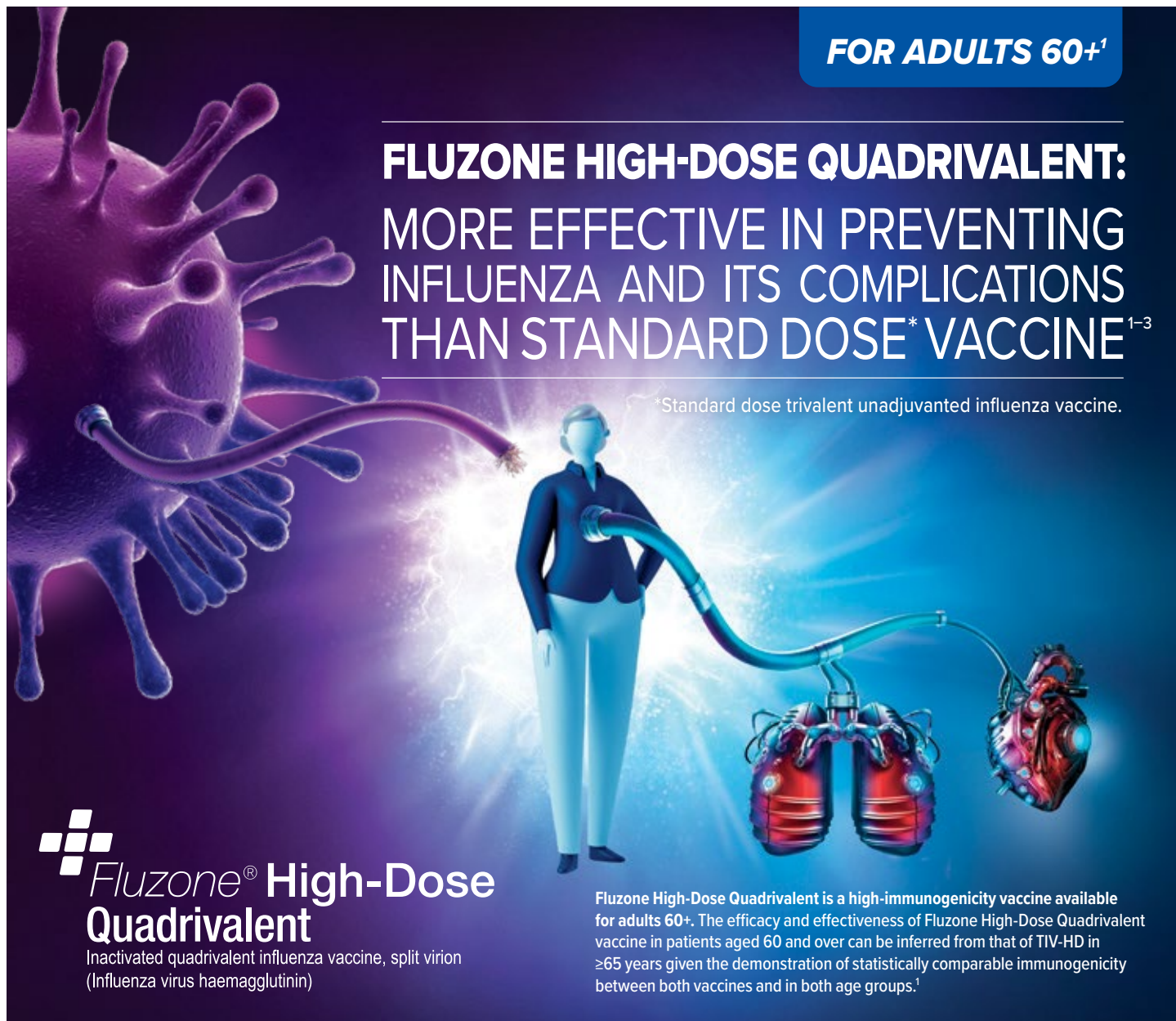
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TIV-HD=high-dose trivalent influenza vaccine. **References:** 1. Fluzone High-Dose Quadrivalent Approved Product Information, 3 February 2023. 2. DiazGranados CA *et al.* *N Engl J Med* 2014;371:635–45. 3. DiazGranados CA *et al.* *Vaccine* 2015;33:4988–93. sanofi-aventis Australia Pty Ltd. ABN 31 008 558 807. Trading as SANOFI. 12–24 Talavera Rd, Macquarie Park NSW 2113. Customer Service Ph: 1800 829 468. MAT-AU-2300512. Ward 6. SAIN29526W. Date of preparation: April 2023.

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News in Brief

Wearable devices in cardiovascular medicine

Smartwatches, activity trackers, and other types of wearable device are commonly used by patients on a daily basis to monitor their health and well-being. This detailed review article summarises the features of a range of wearable devices and associated artificial intelligence. Key research studies that illustrate the role of wearable devices in the screening and management of cardiovascular conditions are described and directions for future research identified. Barriers to the widespread use of wearable devices in cardiovascular medicine are discussed and short- and long-term solutions to promote increased use of wearable devices in clinical care are proposed.

<https://tinyurl.com/mrvwx6r9>

Cytokines as prognostic biomarkers in pulmonary arterial hypertension

Brain natriuretic peptide and/or its N-terminal fragment are currently the only markers for right ventricular dysfunction used in clinical practice, in association with echocardiographic and invasive haemodynamic variables, to predict outcome in patients with pulmonary arterial hypertension (PAH). The aim of this study was to identify an easily measurable biomarker panel in the serum of well-phenotyped PAH patients with idiopathic, heritable, or drug-induced PAH. The investigators identified a three-biomarker panel composed of β -NGF, CXCL9 and TRAIL, all of which were independently associated with prognosis both at the time of diagnosis and at the first follow-up after starting PAH therapy. The results were validated in a fully independent external validation cohort.

<https://tinyurl.com/mrj2273c>

SCAI/HRS expert consensus statement on transcatheter left atrial appendage closure

This clinical practice advice updates the Society for Cardiovascular Angiography and Interventions (SCAI) 2016 expert consensus statement on the technology and institutional and operator requirements for transcatheter endovascular left atrial appendage closure (LAAC). The consensus statement provides recommendations on contemporary, evidence-based best practices for transcatheter LAAC with an emphasis on endovascular devices. The statement also covers patient selection for LAAC, physician and institutional requirements, pre-procedural imaging, aspects of safe and effective procedure performance, and recognition and management of late adverse events.

<https://tinyurl.com/2u6nhnpp>



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[Product Review](#) – High-Dose Quadrivalent Influenza Vaccine for high-risk patients
[Product Review](#) – Vericiguat in heart failure and reduced ejection fraction
[Educational Series](#) – Pharmacological prevention and management of heart failure: A consensus update

Title	Story
Training for your heart: World-first study on role of exercise for congenital heart disease	Historically, people born with half a heart or single-ventricle congenital heart disease (Fontan-CHD) were told not to exercise for fear of putting too much strain on their heart. But now, researchers at The Heart Research Institute are flipping this notion on the head. The researchers are working to determine whether regular exercise could be the key to improving the life expectancy of CHD patients.
Further info	https://www.hri.org.au/news/training-your-heart-world-first-study-on-role-of-exercise-for-congenital-heart-disease



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