Heartbeat: exercise improves quality of life after acute myocardial infarction

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Although, the primary goal in patients with an acute myocardial infarction (AMI) is to reduce mortality and major adverse events, patient centred measures such as long-term health-related quality of life (HRQoL) also are important. The benefits of exercise for mortality reduction after AMI are well known but the effect on HRQoL has received less attention. In this issue of *Heart*, Hurdus and colleagues¹ examined the temporal association of HRQoL with physical activity levels and cardiac rehabilitation in 4570 patients at 30 days, 6 and 12 months after AMI. Both cardiac rehabilitation and self-reported physical activity of at least 150 min/week were positively associated in improvements in HRQoL at each time point, with an additive effect for physical activity even in those receiving cardiac rehabilitation (figure 1).

In an editorial, Taylor and Dalal² point out that 'When we ask our patients why they want to participate in cardiac rehabilitation (CR), the response that we invariably hear is that they do so because they want to be able to better undertake their activities and roles of daily life—in other words, patients undertake CR to improve their HRQoL.' Although the results of the study reported in this issue of *Heart*,¹ 'require confirmation in a randomised trial, robust scientific methods were employed by this study group, with potential selection bias and confounding minimised by use of a weighted propensity score analysis.' Clearly, we need to incorporate relevant measures of HRQoL in future clinical trials whenever possible.

Prevention of stroke in patients with atrial fibrillation (AF) has been enhanced by the use of non-vitamin K antagonist oral anticoagulants (NOACs). However, effectiveness depends not only on ensuring physicians prescribe NOACs appropriately but also on patients adhering to the recommended therapy. In this issue of *Heart*, Capiau and colleagues³ explored how patient's

actual intake of medication (implementation adherence) was related to their experiences with and beliefs about NOACs. In a series of 766 patients with a mean age of 76 years, almost 21% reported non-adherence, most often due to forgetfulness. Overall, about half the study population failed to take their NOAC on at least 17 days per year, despite a high level of acceptance of the need for therapy (figure 2).

Hendriks and colleagues⁴ propose approaches to improving adherence with NOAC therapy. 'As patients age, multimorbidity increases, and cognitive decline and dementia associated with AF may affect the ability to self-manage medications. Integrated care models in which multiple specialists work closely together can help to identify these changes, and assist patients to receive the help they need. For some increased

Figure 1 Health-related quality of life trajectories of patients with acute myocardial infarction according to their attendance at cardiac rehabilitation and/or self-reported physical activity of ≥ 150 min/week. EQ-VAS, EuroQol 5-Visual Analogue Scale

Figure 2 Scatter plot of the necessity (X-axis) and concerns (Y-axis) scores of the study population. Every dot on the scatter plot corresponds with one necessity/concerns score combination but can include multiple patients. The range of the number of patients per score is indicated with different dot styles. BMQ, beliefs about medicines questionnaire; MPR, medication possession ratio.

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Figure 3 (A) Prevalence of arrhythmias by age groups. (B) Schematic overview of possible inter-relationships between normal physiology, SVE, AF and complications. AF, atrial fibrillation; AV, atrioventricular; NSVT, non-sustained ventricular tachycardia; SVE, supraventricular ectopy; SVT, sustained ventricular tachycardia; VE, ventricular ectopy.

carer support may suffice, while for others text or phone messaging may have a place or the use of dose administration aids may be indicated.’

An ambulatory ECG is a common diagnostic test for patients with palpitations or syncope but the information obtained needs to be interpreted in the context of the normal variation in heart rhythm across the age spectrum. In a meta-analysis of 33 studies than included 6466 healthy adults with ambulatory ECG recordings, Williams and colleagues⁵ found that:

- ▶ Sinus pauses over 3 s in length occurred in <1% of subjects.
- ▶ Any supraventricular or ventricular ectopy was common and increased in prevalence with age.
- ▶ In patients aged 60–79 years, frequent supraventricular ectopy (>1000/24 hours) was seen in 6%, supraventricular tachycardia in

28%, frequent ventricular ectopy (>1000/24 hours) in 5% and non-sustained ventricular tachycardia in only 2%.

Johnson and Conen⁶ summarise this data (figure 3), discuss the definition of ‘normal’ and suggest that additional work is needed in understanding the prevalence and prognostic value of these variations in cardiac rhythm. ‘Only then we can reliably interpret ambulatory ECG recordings and start thinking about reliable interventions to improve patient outcomes.’

The *Education in Heart* article in this issue provides a quick tutorial on the role of imaging for evaluation of aortic and mitral regurgitation.⁷ Key steps in imaging are to identify the mechanism of regurgitation, measure the severity of regurgitation using a multiparametric approach, and assess the consequences of regurgitation, including adverse changes in left ventricular size and function and in pulmonary pressures.

Figure 4 Potential scope of PET imaging in cardiovascular disease. CVD, cardiovascular disease; ICD, implantable cardioverter defibrillator; PET, positron emission tomography; VT, ventricular tachycardia.

A review article on positron emission tomography provides a concise introduction for clinicians of the emerging uses of this advanced imaging modality in clinical diagnosis of patients with ischaemic heart disease, heart failure, prosthetic valve endocarditis and cardio-oncology⁸ (figure 4).

The *Cardiology in Focus* article in this issue is the second of a two-part topic on computer programming for the clinician.⁹

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REFERENCES

- Hurdus B, Munyombwe T, Dondo TB, et al. Association of cardiac rehabilitation and health-related quality of life following acute myocardial infarction. *Heart* 2020;**106**:1726–31.
- Taylor R, Dalal H. It's not the years in your life that matter, it's the life in your years. *Heart* 2020;**106**:1707.
- Capiu A, Mehuys E, Van Tongelen I, et al. Community pharmacy-based study of adherence to non-vitamin K antagonist oral anticoagulants. *Heart* 2020;**106**:1740–6.
- Hendriks J, Gallagher C, Nyfort-Hansen K, et al. Adherence to anticoagulation therapy in patients with atrial fibrillation: is a tailored team-based approach warranted? *Heart* 2020;**106**:1710–1.
- Williams CB, Andrade JG, Hawkins NM, et al. Establishing reference ranges for ambulatory electrocardiography parameters: meta-analysis. *Heart* 2020;**106**:1732–39.
- Johnson LSB, Conen D. Can you feel the beat? how to define reference ranges for ambulatory heart rhythm monitoring. *Heart* 2020;**106**:1708–9.
- Steeds RP, Myerson SG. Imaging assessment of mitral and aortic regurgitation: current state of the art. *Heart* 2020;**106**:1769–76.
- Tarkin JM, Čorović A, Wall C, et al. Positron emission tomography imaging in cardiovascular disease. *Heart* 2020;**106**:1712–8.
- Chow J-J. Computer programming for clinicians: five steps to your new favourite skill. Part 1. *Heart* 2020;**106**:1700–1.