

# Exercise as cardiovascular medicine



CPD 

**Edward Garrahy**, Kade Davison, Sibella Hardcastle, Jane O'Brien, Scott Pedersen, Andrew Williams, Jan Radford

## Background

Physical inactivity is a major modifiable contributor to the global burden of cardiovascular disease (CVD) morbidity and mortality.

## Objective

In this article, a clinical case study is used to provide practical approaches for general practitioners and their teams to individualise exercise prescriptions for patients with hypertension who are at risk of CVD. The case presented describes a sedentary, overweight male with newly diagnosed hypertension – a common scenario in general practice.

## Discussion

The many benefits of exercise are supported by an expanding body of research. Blood pressure can be safely and effectively reduced through physical activity, leading to a lower CVD risk. Value-based goal setting and the 'FITT' framework may be used to facilitate sustainable physical activity among patients. The engagement of allied health professionals such as exercise physiologists may also be beneficial.

**A SUBSTANTIAL BURDEN** of global cardiovascular disease (CVD) morbidity and mortality is attributable to a sedentary lifestyle.<sup>1</sup> CVD is the leading cause of death in Australia, accounting for more than 19,000 deaths in 2016.<sup>2</sup> Hypertension is a major risk factor for CVD and is responsive to multiple non-pharmacological approaches, including weight loss,<sup>3</sup> the Dietary Approaches to Stop Hypertension (DASH) diet,<sup>4</sup> physical activity<sup>5</sup> and reduction of alcohol consumption.<sup>6</sup> This article focuses on physical activity as a modality to decrease blood pressure and CVD risk.

The efficacy of single-agent antihypertensive medications is similar to that of physical activity. A large meta-analysis<sup>7</sup> found that the systolic blood pressure (SBP)-lowering effect of single-agent therapy was no different to that of physical activity among patients with hypertension (SBP >140 mmHg), with physical activity reducing SBP by 8.96 mmHg (95% credible interval –10.27 to –7.64). Additionally, antihypertensive medications are not without harms, including the risk of hypotension, syncope, electrolyte abnormalities and acute kidney injury.<sup>8</sup>

The modest benefits of antihypertensive medications stand in contrast to the

broad-ranging benefits provided by engaging in physical activity,<sup>9</sup> with benefits extending to all-cause mortality. A large observational study showed a 50% decreased mortality risk among those engaging in vigorous exercise (at least 20 minutes three times a week) combined with regular exercise (at least 30 minutes of moderate activity most days of the week).<sup>10</sup> Physical activity also contributes to weight loss and the maintenance of a healthy body mass index (BMI).<sup>11</sup>

The current Australian physical activity guidelines<sup>12</sup> were developed to mitigate risk related to sedentary behaviours. However, despite the established benefits of regular physical activity, 85% of Australians aged 18–64 years fail to exercise sufficiently to meet the guidelines.<sup>13</sup> General practitioners (GPs) operating at the forefront of primary prevention are well placed to prescribe physical activity for all patients. Exercise advocacy in the primary care setting has been shown to promote sustainable increases in activity levels<sup>14</sup> as GPs tend to cultivate long-term relationships with their patients, with more than 87.8% of patients visiting their GPs at least once per year,<sup>15</sup> highlighting the general practice setting as a potentially powerful arena for effecting behavioural change.

**CASE**

Patrick Corbett, aged 45 years, is a man who works as a manager for an insurance company. He is married to Jane, and they have two sons, Daniel and Oliver, aged six years and nine years. Mr Corbett attends your practice at his wife's request for a check-up. He tells you that his father had a heart attack last year at the age of 63 years, and since then Mr Corbett has been checking his blood pressure at home using his father's blood pressure monitor. You note from his history that his blood pressure was elevated at 152/84 mmHg and 155/82 mmHg on his previous two visits. He has brought his home readings, which he has recorded in a notebook over the past month, to the appointment with him, confirming consistent SBP readings of approximately 150 mmHg. He presently does not take any medications and he is a never-smoker who consumes 2–3 standard drinks at the weekend. He sleeps well and feels refreshed in the mornings. According to Jane, he does not snore at night.

With his history of unmanaged high blood pressure readings and a family history of ischaemic heart disease, you surmise that Mr Corbett could be at risk of CVD. You decide to assess his activity levels. He tells you that he has not had much time to engage in exercise as he works a 50–60-hour week. He drives 30 minutes to work and usually takes the elevator to reach his third-floor office, where much of his work is carried out seated at his desk. He had previously been a member of a gym, but by the time he finished his workday he was too tired to attend as he often comes home after 7 pm.

On examination, Mr Corbett's BMI is 29.5 kg/m<sup>2</sup>, with a weight of 88.3 kg and a height of 173 cm. His blood pressure readings today average 158/98 mmHg. His previous lipid profile from one year ago showed high-density lipoprotein of 0.6 mmol/L, low-density lipoprotein of 3.7 mmol/L, triglycerides of 2.3 mmol/L and a total cholesterol of 6 mmol/L. Based on today's reading, Mr Corbett has mild hypertension, and his calculated absolute cardiovascular risk is 10%.<sup>16</sup> He will require an updated lipid profile

and electrocardiogram in order to more accurately stratify his risk.

You explain to Mr Corbett that he fits the criteria for a diagnosis of hypertension and that he has a one in 10 chance of having a heart attack or stroke in the next five years. You discuss lifestyle advice for reducing blood pressure – including exercise, the DASH diet and minimisation of alcohol intake – as well as the rationale for preventive medication should he continue on his current trajectory. Mr Corbett says he wants to avoid taking medications if he can. He also tells you that he is worried about having a heart attack like his father, and this leads you to discuss his hopes for the future and his core values.

You discuss the recommended physical activity levels with Mr Corbett. These include: undertaking physical activity on most days of the week, accumulating 2.5–5 hours of moderate-intensity physical activity per week, engaging in 1.25–2.5 hours of vigorous-intensity physical activity per week, undertaking muscle-strengthening activities on at least two days per week

and avoiding prolonged sitting.<sup>17</sup> These recommendations will need to be integrated with Mr Corbett's personal values in order to become actionable.

**Value-based goal setting**

Mr Corbett is hypertensive and overweight, and he leads a sedentary lifestyle. In these respects, he is representative of many patients visiting their GPs today in Australia. Your objective as his GP is to assist him in enacting behavioural changes that are beneficial and sustainable. It may be useful to align Mr Corbett's goals with the 'SMART' criteria (Box 1),<sup>18</sup> which help to guide goal setting.

Maintenance of healthy lifestyle behaviours over time requires patients to identify and internalise their core values.<sup>19</sup> Core values refer to qualities of physical or psychological action; they describe the pursuit of the 'ideal' self and can be used as a referential anchoring system that allows patients to contextualise the 'why' behind their behaviours and goals. Linking the patient's behaviours

**Box 1. Values-based SMART goals for non-exercise physical activity****Specific**

Determine what will be done (type), how often (frequency), how hard (intensity) and for how long (time). It is also important to identify at this level the 'why'. For example, 'To have more energy to play with my sons, I want to increase my number of **steps** (type) each **day** (frequency), including some **brisk walks and some stairs** (intensity), by **10% each week** (time)'.

**Measurable**

Aim to quantify a physical activity goal. This can be measured in minutes per day, frequency of specific activity (eg use the stairs at least five times at work) or number of steps. Technology can be useful to collate activity. Watches can count steps, heart rate or both, and some free health apps available on smartphones can count steps.

**Achievable**

Start with a manageable amount of activity. This will vary from person to person depending on their fitness, perceived readiness to change, opportunity to accumulate non-exercise activity and personal values. It is better to start with an achievable goal to build confidence and self-efficacy and work to extend this over time.

**Relevant**

Ensure the activity goal is relevant to the desired clinical outcome, evidence based for the specific presentation and relevant to the individual's values and motivators.

**Time-based**

Incorporate a time-based factor. This might be based on working towards a particular goal over time, such as adding five minutes or 200 steps each few days, or might be how long to sustain a certain activity behaviour until checking in and reviewing, for example, 'Let's see if you can increase your step count and number of flights of stairs by 10% each week for the next four weeks and we can revisit at that point'.

to a core value system overcomes the frustrations of not meeting certain targets or the complacency of attaining them and subsequently discontinuing the desired behaviour. Goals that are self-chosen and reflect the patient's core values (their 'true self') are easier to implement and easier to self-regulate in the long term.<sup>20</sup>

Eliciting Mr Corbett's core values will be key to increasing his physical activity levels. Values can be identified by asking questions such as, 'What matters to you in the big picture of life?', 'How do you want to treat yourself and others around you?', and, 'What personal qualities or strengths do you want to develop?' Questioning in the spirit of motivational interviewing, using strategies similar to those employed during smoking cessation counselling, can be used to elicit motives that will help to sustain new behaviours.<sup>21</sup>

#### CASE CONTINUED

You learn from your assessment that Mr Corbett values spending quality time with his family as well as spending time outdoors. He resents the long hours he spends at work as this limits his family time, and he feels that in the future he might want to cut back on his work commitments. He is fearful of having a

heart attack like his father, who worked very hard but now is very restricted in his ability to engage in activities outside the home. Mr Corbett places a strong value on his relationship with his two children and with his wife, Jane.

#### The 'FITT' framework

Unfortunately, for many patients the term 'exercise' is associated with negative connotations and increased anxiety, and Mr Corbett is no exception. Defining the terms 'exercise' and 'physical activity' and using the 'FITT' (frequency, intensity, time and type) framework<sup>22</sup> may help to overcome barriers or general resistance to healthy behavioural change.

Starting the discussion with 'type' allows the GP to explore the patient's personal likes and dislikes concerning physical activity, bearing in mind that endurance, resistance and isometric exercises are all effective for blood pressure reduction.<sup>7</sup> Here, the GP can remind the patient that any movement is beneficial; for example, during work, patients can consider incorporating more 'non-exercise physical activity' (NEPA) into work-related tasks such as collecting photocopies after every print or setting a

timer to get up from the desk at 30-minute intervals. Office workers who interrupted their daily occupational sitting patterns showed significant reductions in blood pressure readings after just 13 weeks of using a computer-based prompting system that reminded employees to engage in movement breaks during work.<sup>23</sup> Patients who do not normally engage in leisure time physical activity may be more willing to engage in NEPA during work hours. Any increases in daily movement should be considered a step in the right direction.

For many patients, 30 minutes of continuous physical activity may be unrealistic because of competing schedules. GPs can encourage patients to accumulate their 30 minutes in smaller doses over the course of the day. To help monitor this process, activity trackers found on smartphone apps or smart watches can help patients keep track of their progress towards their goals. These goals can be adjusted as patients begin to prioritise their activity levels. A recent systematic review found that the use of such trackers leads to significant increases in daily step counts and moderate-to-vigorous physical activity.<sup>24</sup>

This technology is also useful for monitoring frequency. Most applications allow for data sharing, permitting an element of accountability, which may facilitate long-term behavioural change. GPs could monitor a patient's progress during office visits or suggest that the patient reports their progress to a support person, such as a partner or friend, on a weekly basis to help make the program a team effort.<sup>25</sup>

The final element of the 'FITT' framework of physical activity to discuss with Mr Corbett is intensity. High-intensity or even moderate-intensity exercise can be challenging for patients early in their physical activity journeys. GPs can remind patients that intensity should be relative to their current level of fitness. For example, asking the patient to conduct a conversation during a walk helps to gauge intensity level – at moderate intensity, patients should be able to comfortably talk but not sing, whereas the inability to say more than a few words without gasping for breath indicates a vigorous intensity.

### Box 2. Tips to help patients engage in strengthening exercises for cardiovascular health promotion

- Strength training should include all major body movements in a session (ie at a minimum, pushing and pulling with arms and upper torso muscles, and sit-to-stand movements with the leg muscles).
- Each exercise should involve repeating the same movement continuously until the muscles become too tired to continue.
- The movement should be easy enough to do at least eight times before tiring but not so easy that you can perform it more than 15 times.
- To make a movement harder, you can add resistance by using weights (barbells or dumbbells), machines or exercise bands (the colour of the rubber usually indicates the amount of tension in the band – the darker the colour, the higher the tension).
- After resting for 1–3 minutes, repeat the exercise (perform 2–3 sets of each exercise per session).
- Each exercise should be performed in a slow, controlled manner (take 1–2 seconds to complete the movement in each direction and pause briefly before changing direction).
- If unsure, seek advice from a suitably accredited exercise practitioner (eg an accredited exercise physiologist).
- Be careful to avoid breath holding during each movement. Try to breathe rhythmically with the movement; if possible, exhale on the pushing or pulling part of the movement and inhale when returning to the starting position of the movement.

Once walking and talking becomes easy, patients may be ready to incorporate smart watches that measure heart rate as an indicator of intensity.

#### CASE CONTINUED

Mr Corbett likes the idea of adding strength training to his physical activity regimen. Refer to Box 2 for strength training guidance.

You discuss the concept of NEPA during the workday. Mr Corbett suggests that walking up the stairs to his office instead of taking the elevator would be easy to do. He tells you that his eldest child, Oliver, has started to play soccer for a local team. Mr Corbett wants to be able to keep up with him at the park on the weekends and in the evenings – this aligns with his core value of being a good father while reducing his CVD risk. He also says he will help Jane in the garden at weekends, as this will also enhance their relationship.

You discuss with Mr Corbett the ways in which technology can be used to track the parameters set out by the 'FITT' framework. Mr Corbett is keen to use his phone to monitor his daily step count, and you both agree that he can monitor his activity for the first week and then aim to increase by 10% the following week, increasing as tolerated. He will show Jane his progress as he believes this will help to motivate him.

You provide Mr Corbett with an Exercise is Medicine<sup>26</sup> handout about hypertension and, as per National Heart Foundation of Australia Guidelines,<sup>27</sup> you assess Mr Corbett for secondary causes of hypertension, target organ damage and associated conditions, and plan to see him in four weeks.

#### Conclusion

Mr Corbett seemed motivated by today's consult, and it is likely that an increase in his activity levels will provide a multitude of benefits for his overall health and wellbeing. However, given the challenges involved in sustaining behavioural change, you are aware that he may benefit from

the input of allied health professionals, such as accredited exercise physiologists who are able to provide more tailored and goal-directed advice for patients struggling with physical activity. It will be important to assess Mr Corbett's response through frequent follow-up visits, which will also provide an opportunity to celebrate small wins, engage in problem solving and conduct further motivational interviewing.

#### Authors

Edward Garrahy MB BCh BAO, General Practice Registrar, Newstead Medical, Tas; Academic General Practice Registrar, University of Tasmania, Tas

Kade Davison BAppSci Hum Mov (Hons), PhD, AES, AEP, ESSAM, GAICD, Senior Lecturer in Clinical Exercise Physiology, Allied Health and Human Performance, University of South Australia, SA; Member of Alliance for Research in Exercise, Nutrition and Activity, University of South Australia, SA; President, Exercise & Sports Science Australia, Qld  
Sibella Hardcastle BHumMov (Ex&SpSci) (Hons) ESSAM, AEP, PhD, Lecturer in Clinical Exercise Physiology, School of Health Sciences, College of Health and Medicine, University of Tasmania, Tas  
Jane O'Brien BExSportSc, PGradCert (Mgmt), RN, MAppSci (Research), PhD, Lecturer in Nursing, School of Nursing, College of Health and Medicine, University of Tasmania, Tas

Scott Pedersen BS, MEd, MS, PhD, Senior Lecturer, Motor Behaviour, School of Education, University of Tasmania, Tas; Deputy Associate Dean of Research (HDR), College of Arts, Law, and Education, University of Tasmania, Tas; Director, Active Work Laboratory, University of Tasmania, Tas

Andrew Williams BExSportSc, BSc (Hons), PhD, GradCert ULT, AEP, FEESA, Associate Professor in Clinical Exercise Science, School of Health Sciences, College of Health and Medicine, University of Tasmania, Tas

Jan Radford MBBS, MPsyMed, MEd, FRACGP, FARGP, GAID, AFANZAHPE, Churchill Fellow 2017, Associate Professor of General Practice, Launceston Clinical School, Tasmanian School of Medicine, University of Tasmania, Tas; General Practitioner, West Tamar Health, Tas; Provost, Tasmanian Faculty of the RACGP, Tas. j.radford@utas.edu.au

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correspondence [ajgp@racgp.org.au](mailto:ajgp@racgp.org.au)