Summer 2024

GP Connect

Supporting best practice in cardio-metabolic health

Sydney Cardiology

From the editor – Dr Gunjan Aggarwal

Specialising in general adult cardiology and non-invasive cardiac imaging, particularly echocardiography and cardiac computed tomography (CT).

Welcome to the Summer 2024 edition of GP Connect. This issue provides updates on new leadless pacemakers, familial hypercholesterolemia, and providing low emission and high quality sustainable health care and strategies for recycling and reducing waste in medical clinics.

Dr Bill Petrellis provides an important technological update on a dual chamber leadless pacemaker system. This new system has significant advantages including reduced pocket-related and lead-specific complications, but careful patient selection is important.

Dr Fiona Foo addresses the important issue of contributions to climate change from health care delivery and pathways to low carbon sustainable health care. She summarises the interventions that can be incorporated in our own practices such as prioritising prevention, reducing low-value care and promoting healthy lifestyle interventions.

Dr Abhinav Luhach provides an update on the diagnosis and management of familial hypercholesterolemia including the utility of genetic testing and the newly available small interfering RNA PCSK9 inhibitor molecule inclisiran.

Finally, cardiac sonographer Ms Felisia Vaughn discusses strategies available to medical clinics to recycle waste thereby reducing both operating costs and environmental impact.

I hope you enjoy this edition of GP Connect. We remain available as always to provide continued care to you and your patients in any way possible.

Thank you for your continued support,
Dr Gunjan Aggarwal

In this issue

From the editor	1
Technology update: Intracardiac pacing	2
Our team	6
Holiday hours	6
Our services	7
Sustainability pearls for GPs	8
Embracing circular economy	14
Familial hypercholesterolaemia: What should you know?	16
Healthy heart, healthy planet, healthy heart	18
Clinic locations	20

Access past issues

Click here to access past issues of GP Connect.

All Sydney Cardiology clinics have emergency appointments available for same-day referrals.

Click here to contact your local clinic directly for assistance.

Technology update: Intracardiac pacing

Dr Bill Petrellis

Specialising in general adult cardiology and electrophysiology, including atrial fibrillation and device implantation.

Introducing the world's first dual chamber leadless pacemaker system.

Conventional pacemaker components consist of a pulse generator that is implanted in the chest wall and pacing leads that are positioned transvenously into the atrium and ventricle.

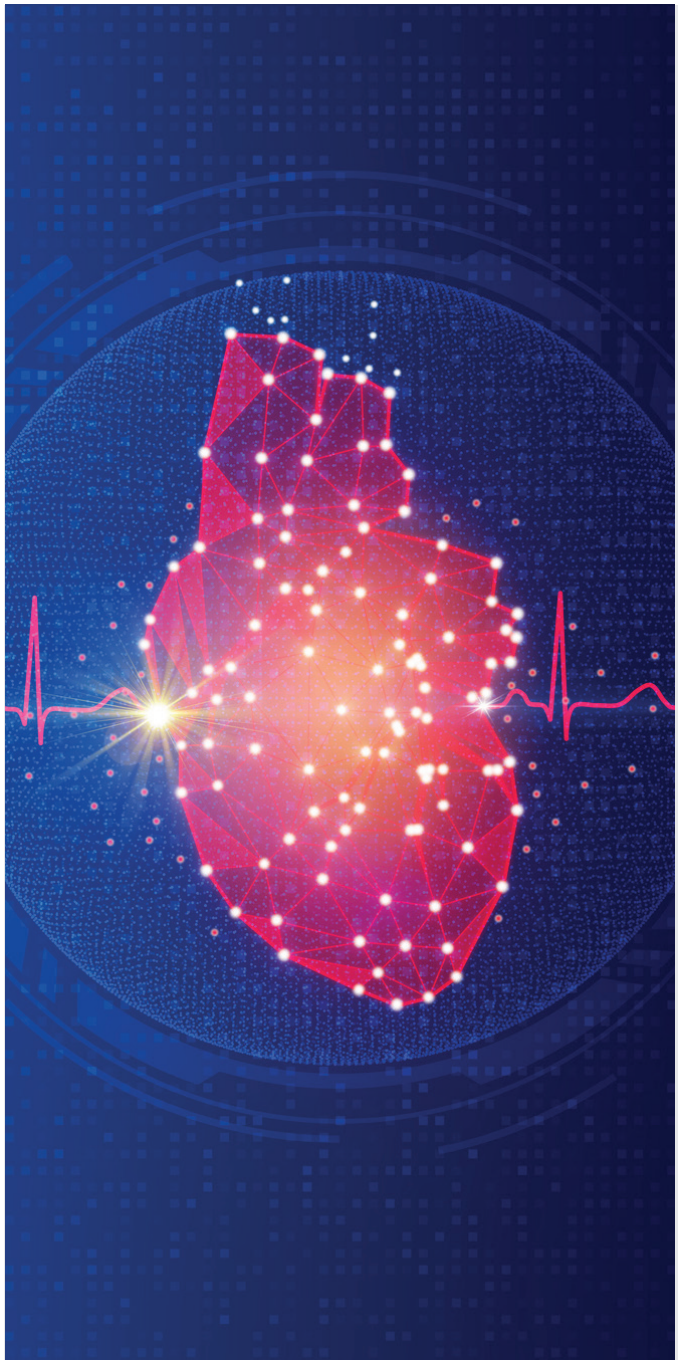
Unlike conventional pacemakers, leadless pacemakers are small, self-contained units that are implanted directly into the cardiac chamber via a minimally invasive approach utilising a catheter delivery system.

The benefits of leadless pacemakers include reduced pocket related complications such as infection, haematoma and erosion. Additionally, lead specific complications such as lead fracture, insulation breach, venous thrombosis and obstruction are effectively eliminated. Patient experience may be enhanced without the visible reminder of a pacemaker such as a chest scar or "bump" and without the imposition of arm movement restrictions.

Figure 1. Medtronic Micra LP

The first leadless pacemaker was the Medtronic Micra VR which was TGA approved in 2016. This tiny device measured 25.9mm in length and despite its volume of only 0.8cc, it provided the capacity for single chamber ventricular pacing with rate response capability for up to 12 years.

Until recently, intracardiac pacing only supported single chamber mode which is unsuitable for patients needing atrioventricular synchrony that can only be provided by a dual chamber pacing system.



Medtronic recently announced their next generation of intracardiac devices, the Micra VR2 (single chamber ventricular pacing) and Micra AV2 (single chamber ventricular pacing plus atrial sensing) with reported improvements in pacemaker programming and enhanced battery longevity (up to 15 years). Although the Micra AV2 can provide AV synchrony by utilising its atrial sensing function, it can only support ventricular pacing (i.e. A sense, V pace), so its application for patients with sinus node dysfunction or a high requirement for atrial pacing is limited.

The Abbott AVEIR™ DR is the world's first dual chamber leadless pacemaker system which consists of two distinct devices, each specifically designed for the right atrium or ventricle. This system supports sensing and pacing of both chambers. Atrioventricular synchrony is made possible through proprietary implant-to-implant (i2i™) communication between each device regardless of posture or gait, allowing the option of modified pacing modes (AAIR, VVIR, DDDR) depending on the patient's pacing requirement over time. This technology employs low-energy, subthreshold, high frequency pulses of data between the implanted devices using the conductive nature of the blood pool and myocardial tissue. The system can be tailored, with the option of starting with a ventricular pacing device, and allowing an upgrade with an added atrial device at a later time to achieve dual chamber pacing.

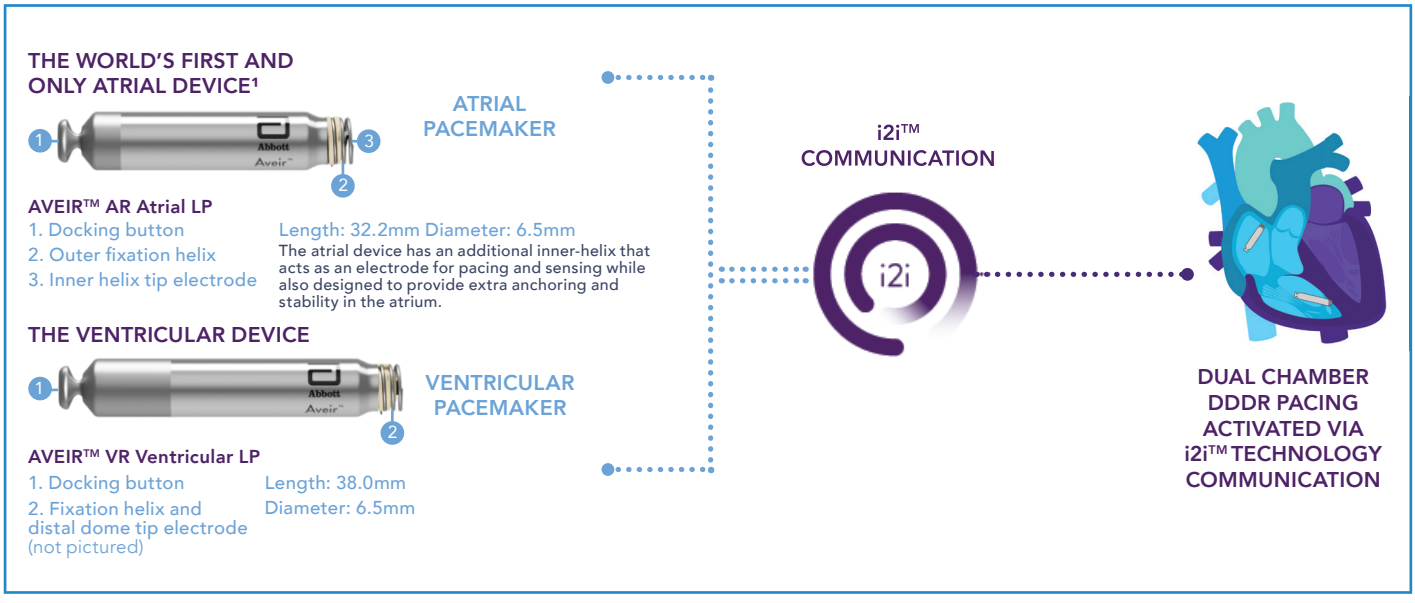


Figure 2. Implant to implant (i2i™) technology allows dual chamber pacing modes by providing beat to beat communication between the atrial and ventricular devices.

Technology update (continued)

The device is implanted using a minimally invasive procedure that offers reduced recovery time and improved patient comfort. After gaining femoral venous access, the AVEIR™ Delivery Catheter (figure 3) with the attached leadless pacemaker, is passed to the right ventricle which is then mapped to locate the ideal implantation site. After electrical measurements confirm satisfactory sensing and pacing parameters, the device is fixed using an active fixation helix (figure 4) and the delivery catheter is then withdrawn. An atrial leadless pacemaker can then be loaded onto a new delivery catheter and positioned within the atrium. The devices are then be paired via i2i™ technology and communication between the devices allows programming of dual chamber mode.

It is reported by the manufacturer that 98% of patients achieve a successful ventricular implant and 90% of patients achieve a successful atrial implant using 1 or less repositioning attempts. Safety and efficacy results reported at 3 months include a dual chamber implant procedure success rate of 98.3%, ≥ 95% mean AV synchrony for multiple postures and gaits and 90.3% freedom from device or procedure related complications.[1]

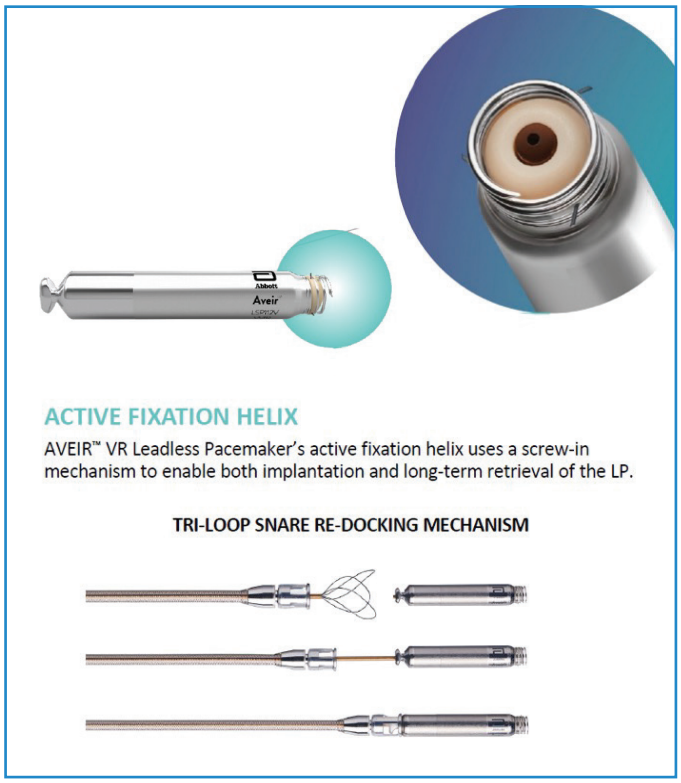


Figure 4. The AVEIR Leadless Pacemaker has an active fixation helix using a screw-in mechanism which enables long-term removal using the AVEIR™ Retrieval Catheter.[2]

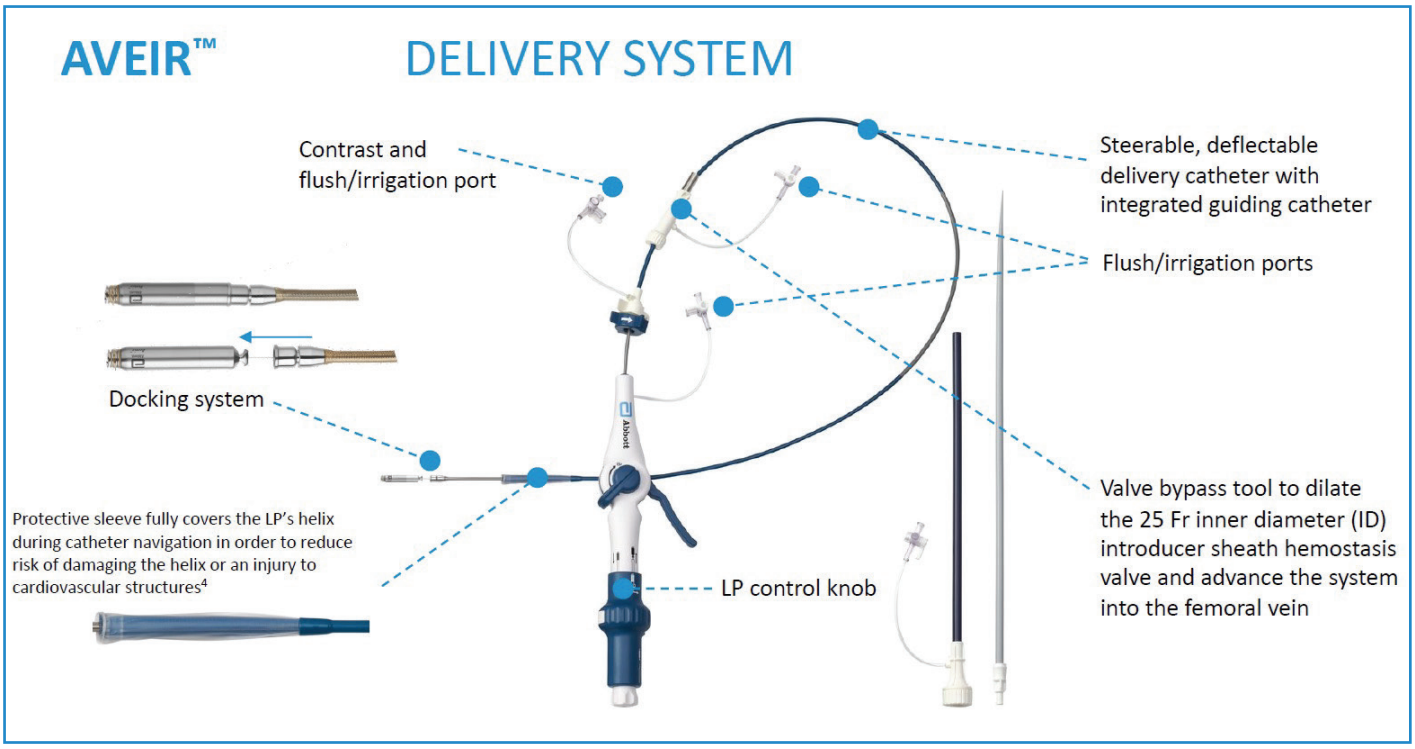


Figure 3. The AVEIR™ Femoral Delivery System

Additionally, AVEIR leadless pacemakers are MRI conditional for full body scans using a 1.5T or 3T field strength MRI scanner.

Although leadless pacemakers offer many advantages, their limitations should also be considered. While leadless pacemakers offer remote monitoring, the capabilities may not be as comprehensive as those available with traditional devices. There is a risk of device dislodgement from its original position, which could affect its performance or require surgical intervention. Extracting leadless pacemakers can be more complex as the docking mechanism needs to be snared with a retrieval tool. The pacemaker itself is directly anchored to the myocardium and may become encapsulated over time requiring surgical extraction. Being a relatively new technology, there is less long-term effectiveness and complication data compared to conventional pacemakers.

Device longevity is a critical factor for young patients that require pacing over many years. As leadless pacemakers have a battery life of 5 to 15 years, the need for future cardiac procedures must be taken into consideration, especially that of successful device retrieval for the purposes of debulking (removal of depleted devices) or in the event of device infection. On a positive note, the absence of leads may offer better compatibility with younger patients' active lifestyles and improve the psychosocial acceptance of a device on aspects of quality of life, body image, sports participation and social activities.

These factors underscore the importance of careful patient selection and individualised treatment planning when considering a leadless pacemaker. Ongoing research and development will likely to lead to enhanced performance, longer battery life and more advanced features. Conduction system pacing (i.e. left bundle area pacing) may also be on the horizon for the treatment and prevention of heart failure in pacemaker recipients. Ongoing studies are required to establish long-term safety and efficacy, potentially leading to a broader acceptance and use in various patient populations.

References:
1. Reddy, VY, et al. Worldwide Experience with Leadless Pacemaker Retrievals: A Worldwide Nanostim Experience out of 9y. Presented at: APHRS 2022; Nov 18-20, 2022; Singapore. **2.** Knops, Reinoud E., et al. "A Dual-Chamber Leadless Pacemaker." New England Journal of Medicine (2023). DOI: 10.1056/NEJMoa2300080

Our team

We have experienced cardiologists in all major sub-specialties to provide the highest quality of patient care. We also have specialists in related fields including endocrinology and respiratory medicine. Our Sydney Cardiology team includes:

Cardiology

Dr James Wong

Specialising in general cardiology, prevention of coronary artery disease and hypertension.

Dr Gunjan Aggarwal

Specialising in general adult cardiology and non-invasive cardiac imaging, particularly echocardiography and cardiac CT.

Dr Ru-Dee Ting

Specialising in general and interventional cardiology, including cardiac haemodynamic studies and complex coronary intervention.

Dr Bill Petrellis

Specialising in general adult cardiology and electrophysiology, including atrial fibrillation and device implantation.

Dr Abhinav Luhach

Specialising in general adult cardiology, cardiac CT, and preventive cardiology.

Dr Andrew Terluk

Specialising in general cardiology with an interest in cardiomyopathy in the setting of cancer.

Dr Fiona Foo

Specialising in general and interventional cardiology with an interest in heart disease affecting women and sports cardiology.

A/Prof Martin Brown

Specialising in advanced heart failure, pulmonary hypertension, and transplant cardiology.

Endocrinology

Dr Suja Padmanabhan

Specialising in diabetes and general endocrinology with a special interest in diabetes in pregnancy and women's health.

Respiratory Medicine

Dr Tracy Smith

Respiratory and sleep physician specialising in respiratory disease with a special interest in respiratory failure due to lung or heart disease.

Holiday Hours 2024/2025

Over the Christmas period, Sydney Cardiology rooms are open at the following locations. Please call our rooms to make an appointment.

For the on call cardiologist, please call our pager service on **9966 7700.**

From Week 13 Jan onwards all clinics are back to normal operation.

Bella Vista	Blacktown	Chatswood
02 9422 6000	02 9422 6050	02 9422 6040

Parramatta	Sydney City
02 9422 6060	02 9422 6080

MON	TUE	WED	THUR	FRI
16 Dec All Locations	**17 Dec** All Locations	**18 Dec** All Locations	**19 Dec** All Locations	**20 Dec** All Locations
23 Dec Bella Vista Blacktown Chatswood Parramatta	**24 Dec** Bella Vista Blacktown Chatswood Parramatta	**25 Dec** **PUBLIC HOLIDAY** Closed	**26 Dec** **PUBLIC HOLIDAY** Closed	**27 Dec** Closed
30 Dec Bella Vista (AM only)	**31 Dec** Bella Vista (AM only)	**1 Jan** **PUBLIC HOLIDAY** Closed	**2 Jan** Bella Vista Chatswood	**3 Jan** Bella Vista Chatswood
6 Jan Bella Vista Blacktown Chatswood Parramatta	**7 Jan** Bella Vista Blacktown Chatswood Parramatta	**8 Jan** Bella Vista Blacktown Chatswood Parramatta	**9 Jan** Bella Vista Blacktown Chatswood Parramatta	**10 Jan** Bella Vista Blacktown Chatswood Parramatta

Our services

Sydney Cardiology is a world class comprehensive cardiology service, delivered with expertise and experience. Using state of the art diagnostic equipment in all five clinic locations, Sydney Cardiology strives to provide exemplary outcomes for long term patient care.

Urgent access

We provide same-day urgent appointments and 24/7 on-call support for GPs with a dedicated phone number, **02 9966 7700**.

Non-invasive testing

Including stress-echocardiography, echocardiography, holter monitor studies, ambulatory blood pressure studies, coronary calcium score, dobutamine stress echo, electrocardiogram and event monitor recording.

Echo, ABP, and holter monitor-only referral services

We provide echo-only, ABP-only, and holter monitor-only referral services, with a summary report on any adverse findings.

Electrophysiology

Including diagnostic electrophysiology studies, ablation of cardiac arrhythmias, cardiac device implantation, pacemakers and defibrillators, and follow up of implanted cardiac devices.

Cardiac procedures

Including coronary angiography, cardiac biopsies, right heart catheterisation, transesophageal echocardiogram and coronary angioplasty.

Including renal and lower limb angioplasty, ankle brachial index and SphygmoCorR central blood pressure testing.

ECG fax service

For urgent advice, 12-lead ECGs can be faxed to our locations.

Bella Vista - Fax: 02 9672 6214

Blacktown - Fax: 02 9676 8900

Chatswood - Fax: 02 9411 1904

Parramatta - Fax: 02 9635 1247

Sydney City - Fax: 02 9422 6081

Peripheral vascular services

Including renal and lower limb angioplasty, ankle brachial index and SphygmoCorR central blood pressure testing.

In-hospital care

All patients with appropriate private health coverage undergoing hospital procedures, do not incur any out-of-pocket costs. Sydney Cardiology has access to leading private hospitals, including:

Sydney Adventist Hospital
Wahroonga

Norwest Private Hospital
Bella Vista

Macquarie University Hospital
North Ryde

Northern Beach Hospital
Frenchs Forest

Patient fees

Sydney Cardiology is a private clinic however there are no out of pocket costs for Department of Veterans Affairs patients.

Referrals

To request a referral pad, click here.

Sustainability pearls for GPs

Dr Fiona Foo

Specialising in general and interventional cardiology with an interest in heart disease affecting women and sports cardiology.

Did you know?

Worldwide, healthcare contributes 4-6% of greenhouse gas emissions – if the global healthcare sector were a nation, it would be the 5th largest emitter.[1]

Australia snapshot:

- Ranked 8th highest source of greenhouse gas emissions in the world.[2]
- Healthcare accounts for 7% of Australia's total carbon footprint.[3]
- In 2020, total healthcare emissions increased 30% from 2019 to 28.9 Mt.[2]
- >90% of healthcare sector's emissions are indirect, including equipment, medicines, foods.[4]
- Healthcare waste is the 2nd largest contributor to waste nationwide (behind the food industry).[5]
- Hospitals disproportionately contribute to healthcare waste through resource intensive procedures.[5]

In NSW, the healthcare system is responsible for:[4]

- 8% of waste produced in the state economy,
- 4% of water use,
- 6.6% of the total estimated Green House Gas Emissions (2017).

The key contributors to NSW environmental footprint are hospitals, pharmaceutical products, medicinal goods, and pathology and diagnostic imaging services.

How does the delivery of health care contribute to changes in the global climate?[6]

- Unnecessary tests, procedures or interventions
- Unnecessary use of resources
- Poor waste management
- Uncontrolled procurement of products
- Unnecessary travel
- Unmanaged energy and water use
- Inadequate, poorly implemented and integrated or delivered public health and preventative health
- Poor use and management of medicines, devices and materials
- Ineffective design and management of facilities.

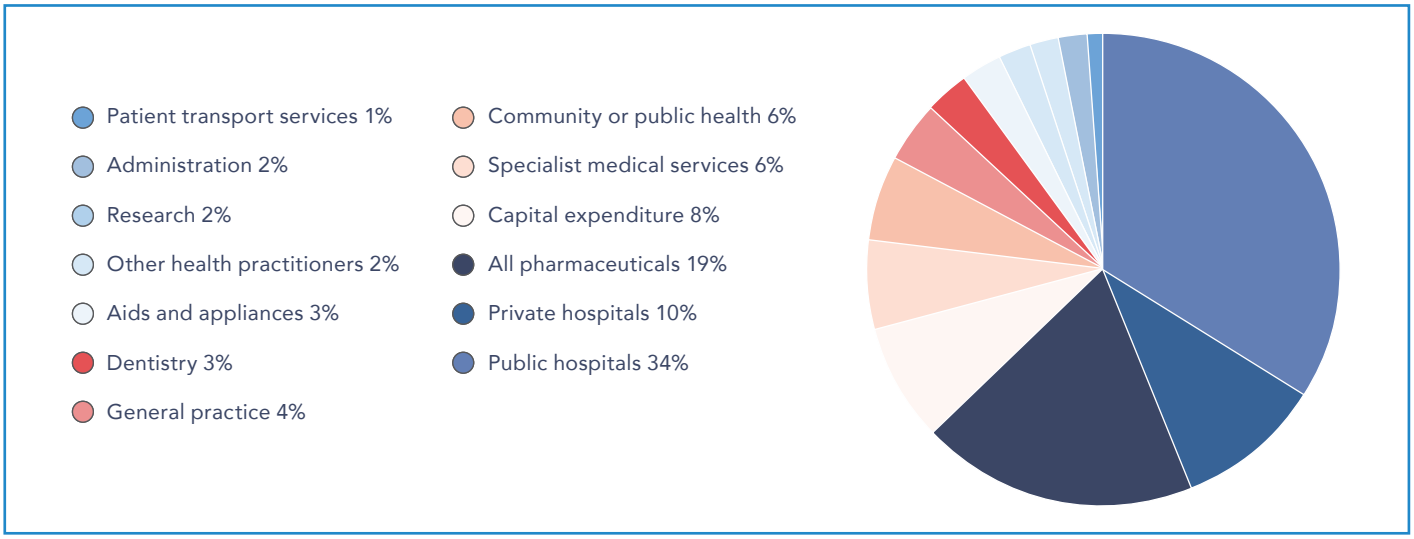


Figure 1. Breakdown of emission sources from Australian healthcare sector.[3]

Pathways to low carbon healthcare: reduce, reuse, recycle, rethink, research, advocate.[7]

On 1st Oct 2024 the Australian Commission on Safety and Quality in Health Care, the interim Australian Centre for Disease Control and Australian medical colleges published a joint statement, Working together to achieve sustainable high-quality health care in a changing climate. According to the statement, there is an urgent need to develop low-emission, climate-resilient and culturally safe models that deliver on the three principles of sustainable health care:[7]

1. Investing in prevention, to improve health while reducing healthcare demand and associated emissions.
2. Minimising potentially harmful and wasteful care, which accounts for around 30% of the emissions footprint of clinical care.
3. Minimising emissions associated with the delivery of high-value care.

A 4th principle is Patient Self Care - empowering patients to take a greater role in managing their own health and healthcare.[8]

Sustainability steps that can be incorporated into everyday practice

Prioritise prevention: reducing incidence and severity of disease decreases procedural interventions, hospital admissions, pharmaceutical use, clinic visits, and medical devices etc. – collectively, this lowers emissions and resource consumption. Hospitals account for nearly 50% of healthcare's carbon emissions and generate significant waste, so jeeping patients out of hospital is an important step as well.

Promote lifestyle interventions: plant-based planetary diets, physical activity including active transport, and smoking cessation. Self-care motivates patients to take ownership of their health, and at the same time are better for the environment.

Reduce Low Value Care and Wasteful practices: 30% of Australia's healthcare is low value care, 10% is harmful; which is associated with a significant carbon footprint (see Figure below).[9] Reducing wasteful practices will lower greenhouse gas emissions, improve patient care; decrease harms from overdiagnosis and overtreatment, and help use resources wisely.

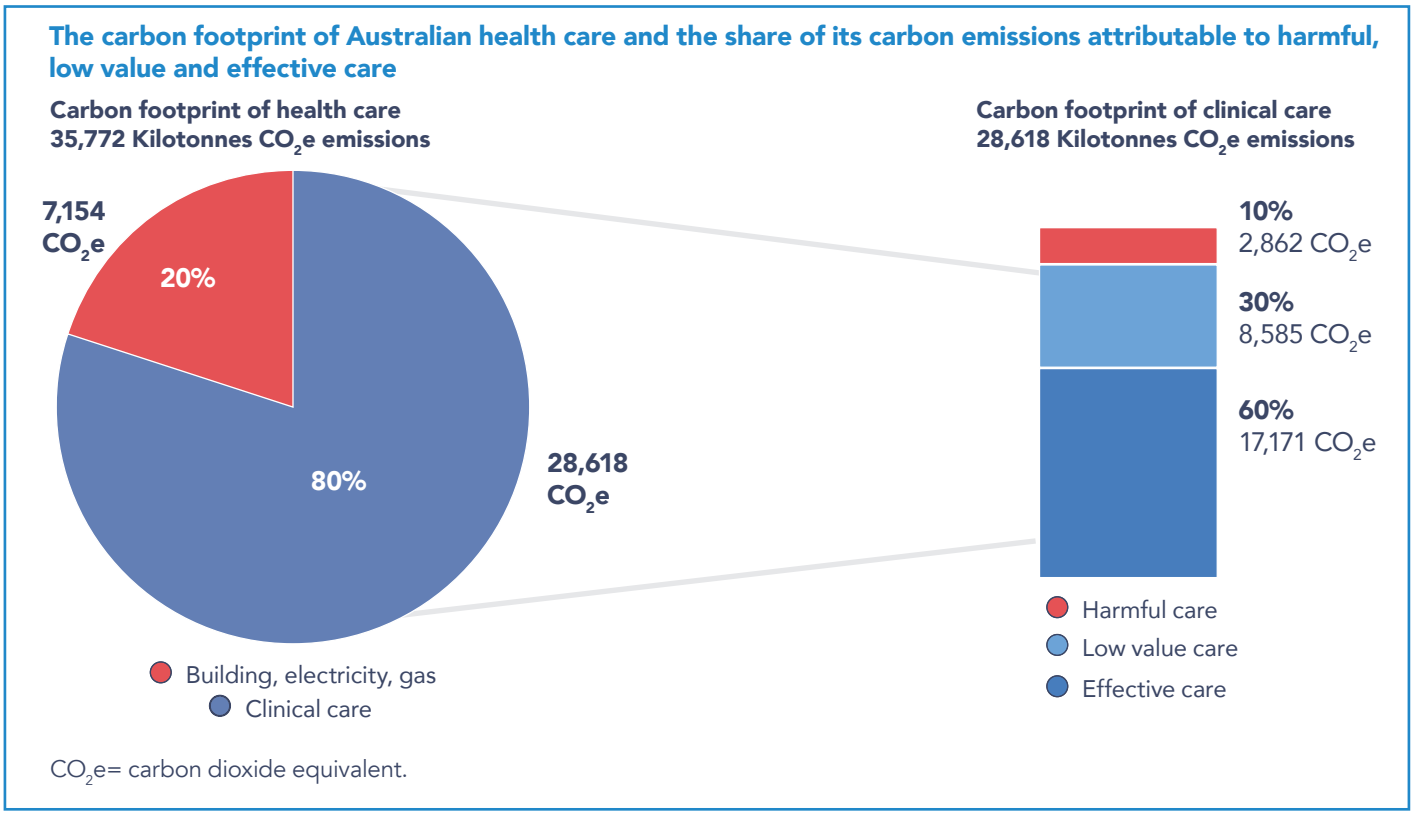


Figure 2. Carbon footprint of Australian healthcare[9]

Sustainability pearls for GPs (continued)

Pathology testing

Pathology testing has a significant carbon footprint. In 2022-2023 >113million medicare subsidised pathology tests were ordered though this is an underestimate as one sample may result in multiple tests and therefore multiple pathology items. Some pathology items cover multiple tests; but is counted as one test. It is estimated that in 2018 nearly 500 million lab tests were ordered, which included tests not covered by Medicare and performed in the hospitals.[10]

Ordering just one extra FBC each shift over a year generates as much carbon as driving 170km.[11]

Imaging

Unnecessary imaging investigations have a significant carbon footprint. One MRI scan emits 18kg CO2 - the equivalent of driving 122km in an average car.[10] Ultrasound, echos and xrays have a significantly lower carbon footprint than CT/MRI.

If your patient requires imaging, is there a lower carbon imaging investigation that can be requested?

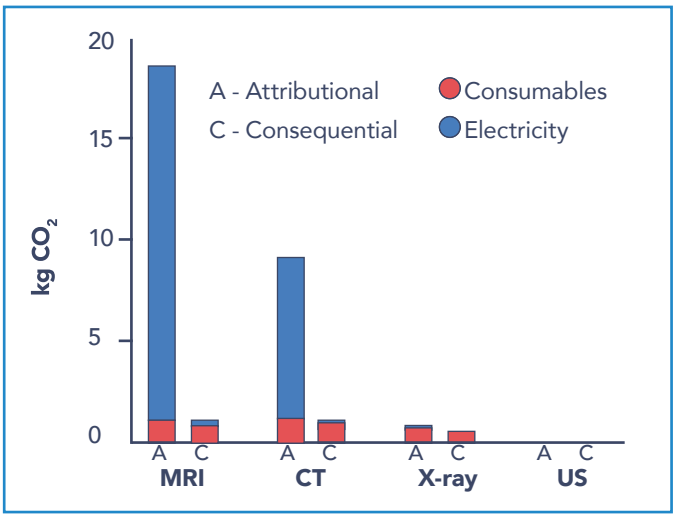


Figure 3. Emissions generated from common imaging investigations.[12]

Carbon dioxide equivalent (CO2e) emissions for five common hospital pathology tests, with distance driven in a standard car producing equivalent emissions

	Mean CO_2e(g) (95% CI)	Equivalent distance in car (km/1000 tests)
Full blood examination	116 (101-135)	770
Coagulation profile	82 (73-91)	540
Urea and electrolytes	99 (84-113)	650
C-reactive protein*	0.5 (0.4-0.6)	3
Arterial blood gases	49 (45-53)	320

CI= confidence interval. *Ordered in conjunction with urea and electrolyte assessment.

Figure 4. Co2 emissions generated from common pathology tests.[12]

Prescribing medicines safely and appropriately

- Lifestyle interventions considered first before pharmacotherapy when appropriate.
- Consider antimicrobial resistance and responsible antimicrobial prescribing.
- Prioritise preventive medications and stop medications that are of no benefit.
- Consider low carbon alternatives, e.g. change to Dry Powder Inhalers (DPIs) rather than pressurised Metered Dose Inhalers (MDIs).

In the 1990s, metered dose inhalers (MDIs) containing chlorofluorocarbons were replaced with dry-powder inhalers (DPIs) and pMDIs containing hydrofluorocarbons (HFCs). While HFCs are not ozone depleting, they are potent greenhouse gases - pMDIs have ~20-30x greater carbon footprint than DPIs.

The reduction in carbon footprint achieved by a person switching from regular pMDI use to DPI use is approximately 420 kg CO2e annually is similar to switching from a petrol car to a hybrid (~500 kg CO2e annually) or becoming vegetarian (~660 CO2e annually).[13,14]

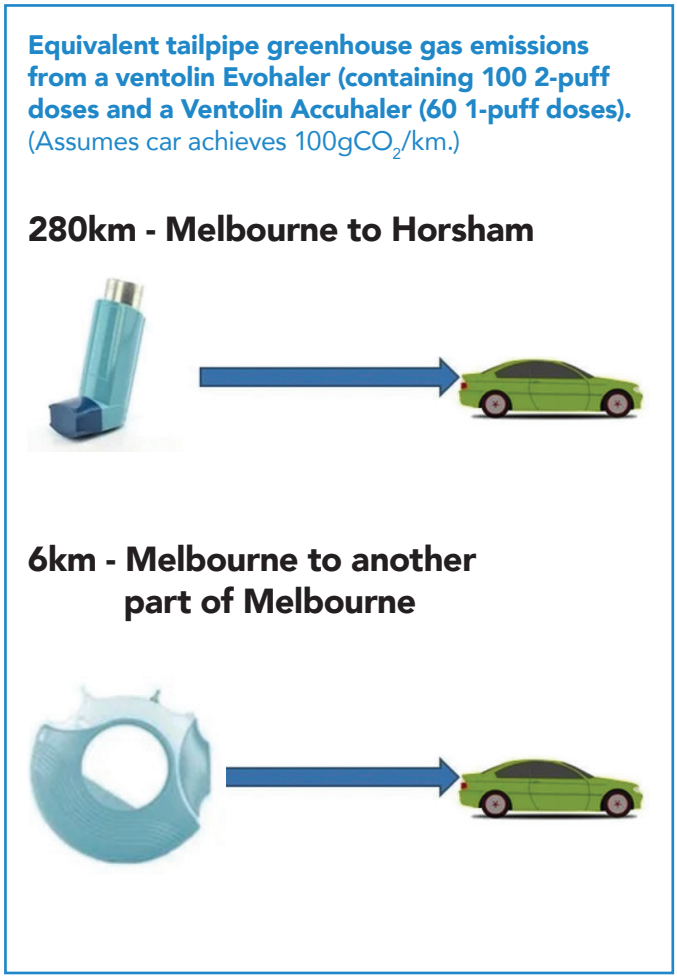


Figure 5. Comparing emissions produced by pMDI and DPIs.[15]

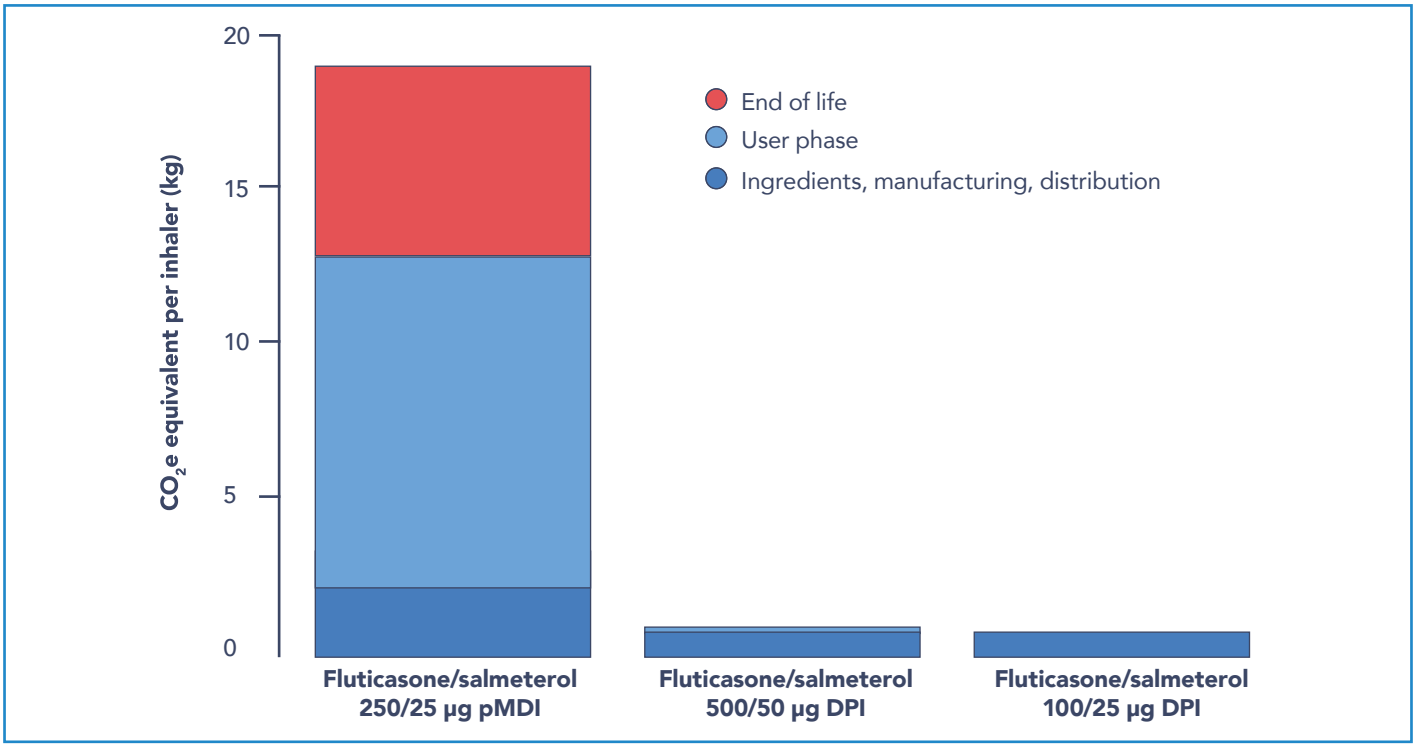


Figure 6. Relative equivalent amount of CO2 per 30-day inhaled treatment with one of the inhalers shown, per inhaler.[16]

Sustainability pearls for GPs (continued)

Reduce Single Use Plastic

Roughly a third of hospital waste is plastic, 98% of plastic is made from fossil fuels which drives climate change, and <10% is recycled.[17] The emissions from Australia's plastic consumption is equivalent to 5.7million cars on the road each year. Plastics never disappear, they continue to break down into smaller particles – micro and nanoplastics have been associated with multiple health effects. A recent study showed patients with asymptomatic carotid artery plaque in which microplastics and nanoplastics were detected had a higher risk of myocardial infarction, stroke or death from any cause than those who did not have the plastic detected.[18] Microplastics and nanoplastics have also been linked to hormonal disruption, weight gain, insulin resistance, reduced reproductive health and some cancers.[19,20]

Gloves off

Evidence in the literature suggests that non-sterile gloves are commonly misused in clinical work, and that healthcare workers are less likely to adhere to hand hygiene practices when wearing non-sterile gloves. Glove overuse then results in increased volumes of avoidable waste being sent to landfill. See figure 7 for appropriate use of non sterile gloves.[21]

Practical tips

- Reduce waste and segregate waste, e.g. recycling, composting food waste.
- Reduce water usage
- Reduce paper by encouraging "think before you print" and using paperless/electronic records.
- Reduce Energy use and change energy provider to renewable energy. Behaviour change e.g. turning off computer monitors overnight, turning off lights and machines when not needed, use light sensors, using low-power lighting and agreeing to run air-conditioning/heating at evidence-based, comfortable temperatures (this varies upon climate but on average for every 1°C of extra heating or cooling, 10% more energy is used).[21,22] Utilising fans in clinics can be an effective way of reducing the amount of air-conditioning energy used.[23]
- Reduce motor vehicle travel by conducting more telehealth appointments where practicable reducing patient, and possibly health professional travel. A pre-operative evaluation centre, that utilised telehealth appointments where appropriate, reduced the facilities CO2 emissions by 31%.[24]
- Consider non-surgical/interventional alternatives
- Encourage care at home

Figure 7. Carbon footprint of Australian healthcare[8]

B.E.T.T.E.R ways of reducing the carbon footprint for small business

Other ways small businesses can reduce their carbon footprint and improve health outcomes is encompassed by the mnemonic B.E.T.T.E.R, which addresses mitigation and adaptation options via Buildings, Energy, Transport, Trees, Electronics and the three R's (Reduce, Reuse, Recycle).[27]

Area	Mitigation and Adaptation Options
B	**BUILDINGS:** Insulation of ceilings, floors, walla, roofs, window frames. Passive cooling design for new buildings. Use of natural light. Light coloured roofs.
E	**ENERGY:** Solar panels and batteries. Source electricity from a renewable energy provider. Turn off products when not in use. Use LED lights.
T	**TRANSPORT:** Provide bike racks to encourage cycling to work. Consider EV charges. Reduce travel by using online meeting options.
T	**TREES:** Provide shade. Support local habitat. Improve mental health.
E	**ELECTRONICS:** Online meetings to reduce travel. Reduce unnecessary streaming. Avoid replacing electronics that still work. Empty your email box.
R	**REDUCE, REUSE, RECYCLE:** Reduce unnecessary consumption. Reuse whenever possible rather than buying a new item. Recycle properly especially avoid contaminating recycling with un-recyclable options.

References: 1. Lenzen M. Malik A, Li M et al. The environmental footprint of healthcare: a global assessment. Lancet Planet Healthh 2020: 4e271-9. **2.** Romanello M, di Napoli C, Green C, et al. The 2023 report of the Lancet Countdown on health and climate change: the imperative 23 for a health-centred response in a world facing irreversible harms. Lancet 2023; 402: 2346-2394. **3.** Malik A, Lenzen M, McAlister S, McGain F (2018). The carbon footprint of Australian health care. The Lancet Planetary Health,2(1):e27-e35. **4.** Malik A, Padge M, Carter S, et al. (2021). Environmental impacts of Australia's largest health system. Resources, Conservation and Recycling. **5.** Wyssusek KH, et al. Operating room greening initiatives - the old, the new, and the way forward: a narrative review, Waste Manag. Res. 2019; 37(1):3-19. **6.** Environmental Sustainability and Climate Resilience Healthcare Module DRAFT VERSION Environmental Sustainability and Climate Resilience Healthcare Module 2. (2023). https://www.safetyandquality.gov.au/sites/default/files/2023-11/environmental_sustainability_and_climate_resilience_healthcare_module_-_draft_version_november_2023.pdf **7.** Australian Government, Department of Health and Aged Care, Joint Statement: Working together to achieve sustainable high-quality health care in a changing climate 1 October 2023. Available at: https://www.safetyandquality.gov.au/sites/default/files/2024-09/Joint-Statement-Working-together-to-achieve-sustainable-high-quality-health-care-in-a-changing-climate.PDF **8.** Mortimer, F, The Sustainable Physician. Clin Me 10 (2). April 1, 2010. P110-111 **9.** Barratt AL, Bell KJ, Charlesworth K, McGain F. High value health care is low carbon health care. Med J Aust. 2022. 216: 67-68. https://doi.org/10.5694/mja2.51331. **10.** Australian Institute of Health and Welfare. (2022, July 7). Pathology, imaging and other diagnostic services. Australian Institute of Health and Welfare. https://www.aihw.gov.au/reports/diagnostic-services/pathology-imaging-and-other-diagnostic-services. **11.** National Transport Commission 'Carbon Dioxide Emissions Intensity for New Australian Light Vehicles 2020' 21 Feb 2023 https://cdn-nrspp-s3-aus.s3.ap-southeast-2.amazonaws.com/wp-content/uploads/sites/4/2021/11/30061913/Carbon-dioxide-emissions-intensity-for-new-Australian-light-vehicles-2020.pdf. **12.** McAlister S, McGain F, Petersen M, et al. (2022) The carbon footprint of hospital diagnostic imaging in Australia Lancet Reg Health West Pac; 24: 100459. **13.** Janson C, Henderson R, Löfdahl M, et al (2020). Carbon footprint impact of the choice of inhalers for asthma and COPD. Thorax;75(1):82–84. doi: 10.1136/thoraxjnl-2019-213744. **14.** Scarborough P, Appleby PN, Mizdrak A, et al. (2014) Dietary greenhouse gas emissions of meat-eaters, fish-eaters, vegetarians and vegans in the UK. Clim Change;125(2):179–92. doi: 10.1007/s10584-014-1169-1. **15.** Green Inhaler. (n.d.). Green Inhaler. https://greeninhaler.org/. **16.** Montgomery B, Blakey J (2022). Respiratory inhalers and the environment. AJGP;51(12). **17.** Geyer R, Jambeck JR, Law KL (2017). Production, Use, and Fate of All Plastics Ever Made. Science Advances, 3(7). https://doi.org/10.1126/sciadv.1700782 **18.** Marfella R, Prattichizzo F, Sardu C, et al. (2024) Microplastics and nanoplastics in athero- mas and cardiovascular events. New England Journal of Medicine;390(10):900- 910. **19.** Li Y, Tao L, Wang Q, et al. (2023) Potential health impact of micro-plastics: a review of environmental distribution, human exposure, and toxic effects. Environment & Health;1(4):249-257. https://doi.org/10.1021/en- vhealth.3c00052. **20.** Lee Y, Cho J, Sohn J, Kim C. (2023) Health effects of microplastic exposures: current issues and perspectives in South Korea. Yonsei Med J;64(5):301-308. https://doi.org/10.3349%2Fymj.2023.0048. **21.** Australian Government Department of Industry; Energy and Resources Household. Heating and Cooling. 2021. Available online:https://www.energy.gov.au/households/heating-and-cooling. **22.** My Green Doctor (2022). Available online: https://mygreendoctor.org. **23.** Rehr R and Perkowitz R (2019) Moving Forward: A Guide for Health Professionals to Build Momentum on Climate Action; Eco America, Climate for Health: San Fransisco, CA, USA. **24.** Wang EY, Zafar JE, Lawrence CM, et al. (2021) Environmental emissions reduction of a preoperative evaluation center utilizing telehealth screening and standardized preoperative testing guidelines. Resour Conserv Recycl; 171, 105652. **25.** FOSSIL FUELS ARE A HEALTH HAZARD A comprehensive report on the health impacts of coal, oil and gas, and a treatment pathway to reduce health harms. Available at: .https://assets.nationbuilder.com/docsenvaus/pages/1412/attachments/original/1723787686/Fossil_Fuels_Health_-2_compressed.pdf?1723787686

Embracing circular economy

Ms Felisia Vaughn

Senior Sonographer

Medical clinics generate significant waste daily, from disposable masks, packaging to paperwork and electronic waste. While some waste is inevitable, much of it can be reduced or recycled. Effective waste management in the clinics is essential not only for cutting operational costs but also for reducing environmental impact.

It is encouraging to see growing efforts by the NSW state and local governments to promote the transition to a circular economy. However, someone must take the lead, initiate the conversation, and drive action in your clinic. For businesses and individuals, contributing to this shift is straightforward: assess your clinic's waste patterns, set up recycling stations, and educate staff on proper waste segregation.

Here are eight practical solutions that we have found useful within our practice:

- Join forces with your team to reduce waste and boost recycling. It takes a village. Most people understand the environmental strain and are prepared to do what is asked as long as it does not require much effort on their part.
- Attempt to fix broken products before discarding them. Repairing medical equipment or office supplies instead of sending them to landfill can significantly reduce costs and extend the life of valuable assets.
- Choose eco-friendly materials with minimal plastic packaging. For example, latex gloves biodegrade faster than nitrile or vinyl, and paper towels with disinfectant spray can replace wet wipes.
- Review your building's waste management system and implement clearly labelled waste segregation bins in all rooms. Graphics and bin labels can be downloaded from https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/business-government-recycling/standard-recycling-signs
- If your building accepts only specific recyclables, take items like batteries, ink cartridges, pens, and x-ray films to Officeworks. Chemist Warehouse and Priceline have drop-off bins for empty blister packs, while services like Recycle Smart, Banish, Reverse Garbage and other council-run recycling centres accept a wide range of 'tricky to recycle' items.
- Contact local wildlife rescue or animal care facilities to donate linens, expired fluids, syringes, needles, or dressing packs.

Last month, in partnership with MediDivert, Sydney Cardiology had the opportunity to deliver expired and short-dated medical supplies to Sydney Wildlife Rescue in the Northern Beaches, where we met the injured wildlife while learning about their care.

- Read about Bin Trim and download the App. It is a government initiative program that helps small to medium-sized businesses quickly find ways of cutting waste and boosting profits. Your business may also be eligible for a rebate.
- Visit resources like www.epa.nsw.gov.au, www.planetark.org, or www.businessrecycling.com.au for easy-to-read recycling guides.

Promoting a **"Waste Less, Recycle More" mindset within your clinic sends a powerful message** about the company's sense of sustainability and responsibility. One person needs to drive the initiative, and once the momentum builds, others will contribute more creative ideas that align with the company culture. As the Dalai Lama said, "Just as ripples spread when a pebble is dropped into water, the actions of individuals can have far-reaching effects."

Sydney Cardiology clinic recycling

Familial hypercholesterolaemia: What should you know?

Dr Abhinav Luhach

Specialising in general adult cardiology with special interests in preventative cardiology, echocardiography (cardiac ultrasound) & cardiac CT.

Familial Hypercholesterolaemia (FH) is the most common inherited gene disorder involving cholesterol. It results in markedly raised cholesterol levels and is associated with premature cardiovascular disease.

Heterozygous FH is present in ~1:300 of the general population (can be higher in certain communities), whilst homozygous FH (associated with much higher cholesterol levels and therefore higher cardiovascular risk) is much rarer. FH is inherited in an autosomal dominant manner. This means a child of an affected parent has a 50% chance of inheriting the condition. In the majority of cases, the mutation involves the LDL receptor gene. A large number of different mutations affecting this gene have now been identified.

Clinicians should be aware about FH because patients with this condition are at very high risk of atherosclerotic cardiovascular disease, including premature ASCVD. This is due to very high LDL levels seen in FH patients, but also the duration patients have had elevated lipids (with FH being present since birth). The majority of FH patients are undiagnosed, and therefore undertreated and left vulnerable to accelerated ASCVD. Given recent developments in lipid lowering therapies, we now have the ability of offer FH patients advanced therapies that are very effective in lowering LDL levels.

Features that should alert a clinician about the possibility of FH in a patient include: the presence of established premature coronary artery disease (CAD), markedly raised LDL levels (>4.9mmol/L) and a family history of premature CAD, FH and/or very high cholesterol levels.

Certain physical findings representing cholesterol deposition have been described and are incorporated into clinical diagnostic criteria (see below), but are uncommon in routine clinical practice.

In suspected patients, use of the Dutch Lipid Score is recommended. This easy-to-use clinical tool (see table; also available online) incorporates a number of readily available variables such as the patients LDL level (untreated), history of premature CAD, family history and physical findings to provide a score. Based on this score, patients are classified as being either being unlikely to have FH, possible FH, probable FH or definite FH.

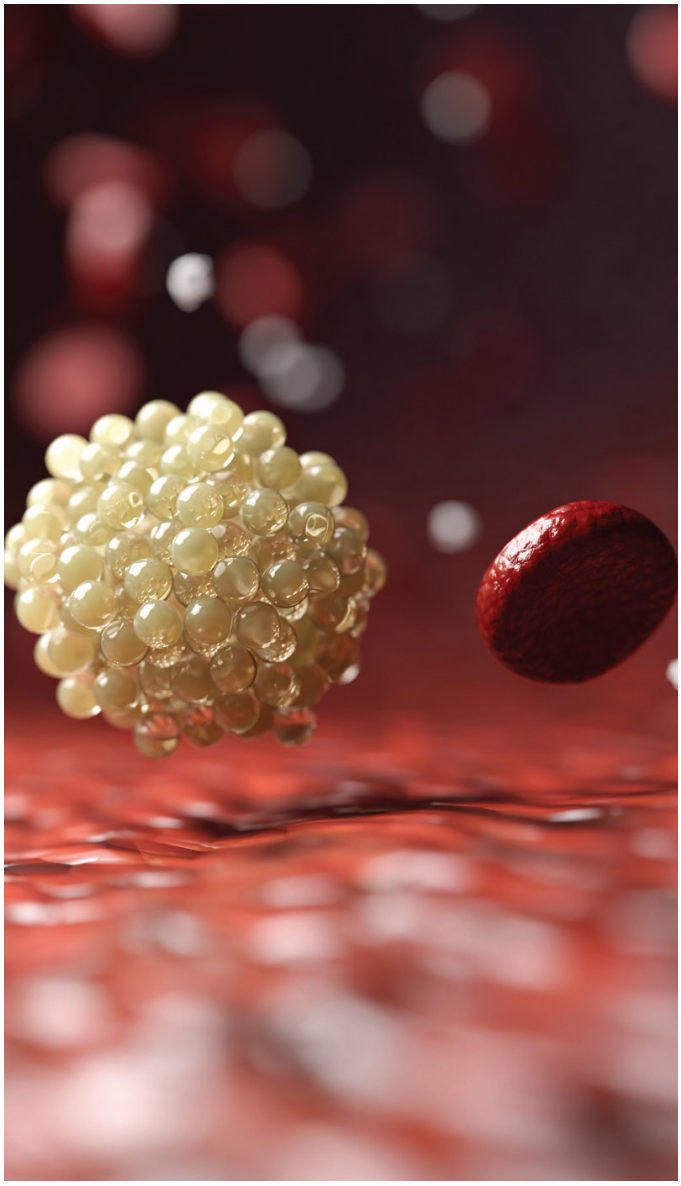


Table 1. Dutch Lipid Clinic Network Criteria scoring for diagnosis of familial hypercholesterolaemia

Criteria	Score
Family history	
First-degree relative with known premature coronary and/or vascular disease (men aged <55 years, women aged <60 years) or First-degree relative with known LDL-C above the 95th percentile for age and sex	1
First-degree relative with tendinous xanthomata and/or arcus cornealis or Children aged <18 years with LDL-C above the 95th percentile for age and sex	2
Clinical history	
Patients with premature coronary artery disease (men aged <55 years, women aged <60 years)	2
Patients with premature cerebral or peripheral vascular disease (men aged <55 years, women aged <60 years)	1
Physical examination	
Tendinous xanthomata	6
Arcus cornealis before 45 years of age	4
Investigation	
LDL-C	
≥8.5 mmol/L	8
6.5-8.4 mmol/L	5
5.0-6.4 mmol/L	3
4.0-4.9 mmol/L	1
DNA analysis	
Functional mutation in LDLR, APOB or PCSK9 genes	8

Stratification	Total score
Definite FH	>8
Probable FH	6-8
Possible FH	3-5
Unlikely FH	<3

Adapted from the National Institute for Health and Clinical Excellence and the National Collaborating Centre for Primary Care

FH familial hypercholesterolaemia: LDL-C, low-density lipoprotein cholesterol.

Current criteria for Medicare reimbursement of genetic testing includes a Dutch lipid score of 6 or above, LDL of ≥ 6.5mmol/L or LDL≥ 5.0mmol/L with evidence of premature atherosclerosis.

Patients considering genetic testing should be offered genetic counselling. The clinical laboratories offering these genetic testings are often able to provide this service, if requested. If a genetic abnormality that causes FH is identified, then the patient's family members should also be offered genetic testing. This is referred to as Cascade testing and is also Medicare rebate eligible. On the other hand, in about 20% of patients with definite clinical FH, genetic testing does not reveal an abnormality in the FH genes.

Patients with FH (diagnosed by either genetic testing or having a Dutch lipid score of ≥6) are often eligible for novel lipid lowering therapies. In Australia, clinicians have had access to Evolocumab (a PCSK9 inhibitor) and more recently Inclisiran (small interfering RNA therapy). Alirocumab, another PCSK9 has been withdrawn. Patients are required to be on maximally tolerated doses of statins and ezetimibe in conjunction with dietary therapy and exercise, as well as meet other criteria as set out by the PBS.

Healthy heart, healthy planet, healthy heart

Dr Fiona Foo

Specialising in general and interventional cardiology with an interest in heart disease affecting women and sports cardiology.

Climate change is the biggest health threat of the 21st century.[1] But tackling climate change could be the greatest health opportunity of the 21st century.[2]

The effects of climate change – heat exposure, air pollution, mental health issues arising from extreme weather events – are increasing cardiovascular disease incidence, morbidity and mortality.[3] However there are actions that can be taken to benefit not only heart health, but also the planet – my top 6 are summarised in Figure 1.

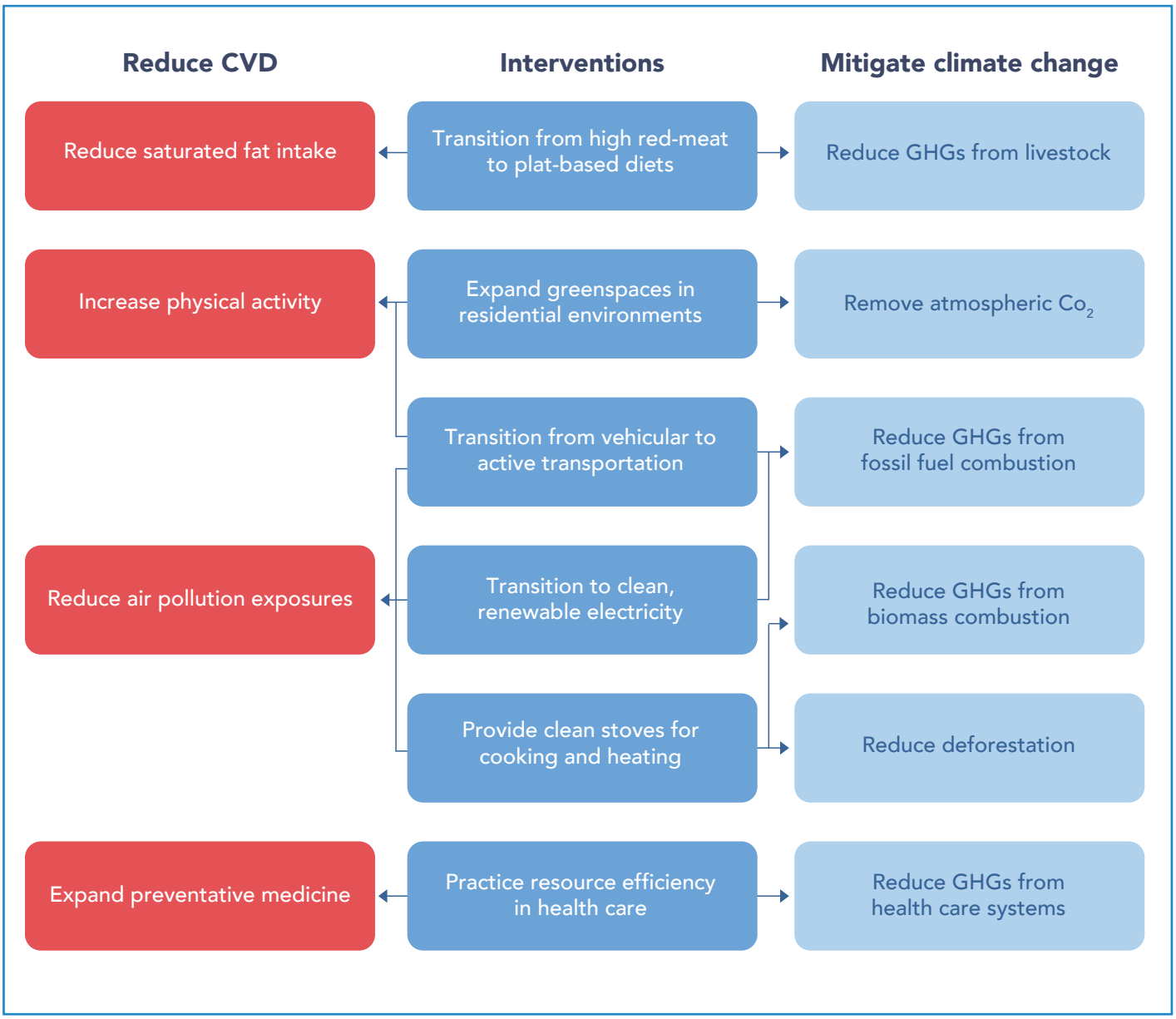


Figure 1. Interventions with co-benefits to reduce the global burden of cardiovascular disease and mitigate climate change

For more information:

Shrestha P, Nukala SK, Islam F, Badgery-Parker T, Foo F (2024), The co-benefits of climate change mitigation strategies on cardiovascular health: a systematic review. Lancet Regional Health-Western Pacific;48. https://doi.org/10.1016/j.lanwpc.2024.101098.

Port Douglas Heart Meeting 2024: Cardiac co-benefits of climate change mitigation. https://youtu.be/Yx0ZW-1Hp9g?si=kVTHnHltrvmIEKDo

Podcasts: Climate change and CVD with Dr Fiona Foo and Dr Warwick Bishop:

Part 1: https://drwarrickbishop.com/podcast/episode/1/ep348-climate-and-environment-with-dr-fiona-foo-part-1

Part 2: https://drwarrickbishop.com/podcast/episode/1/ep349-climate-and-environment-with-dr-fiona-foo-part-2

References: 1. Costello A, Abbas M, Allen A, et al (2009), Managing the health effects of climate change: Lancet and University College London Institute for Global Health Commission. Lancet;373(9676):1693-1733. doi:10.1016/S0140-6736(09)60935-1. **2.** Watts N, Adger WN, Agnolucci P et al. (2015), Health and climate change: policy responses to protect public health. The Lancet;386(10006): 1861 – 1914. **3.** Jacobsen AP, Khiew YC, Duffy E, O'Connell J, Brown E, Auwaerter PG, Blumenthal RS, Schwartz BS, McEvoy JW (2022). Climate change and the prevention of cardiovascular disease. Am J Prev Cardiol;12:100391. **4.** Hadley MB, Vedanthan R, Ebi KL, et al (2022), Climate cardiology BMJ Global Health 2022;7:e008860.

Clinic locations

All clinics have emergency appointment timeslots available for same-day referrals. Contact any of our clinics directly for more assistance.

Bella Vista

Suite 213, Q Central,
10 Norbrik Drive,
Bella Vista NSW 2153

Tel: 02 9422 6000 | Fax: 02 9672 6214

Blacktown

Suite 4,
15-17 Kildare Road,
Blacktown NSW 2148

Tel: 02 9422 6050 | Fax: 02 9676 8900

Chatswood

Suite 901, Level 9, Tower B,
799 Pacific Highway,
Chatswood NSW 2067

Tel: 02 9422 6040 | Fax: 02 9411 1904

Parramatta

Level 5 Suite 501, B1 Tower,
118 Church Street,
Parramatta NSW 2150

Tel: 02 9422 6060 | Fax: 02 9635 1247

Sydney City

Suite 1303, Level 13
68 Pitt Street
Sydney NSW 2000

Tel: 02 9422 6080 | Fax: 02 9422 6081

Sydney Cardiology offers a free after-hours consult service for GPs
Call (02) 9966 7700 for specialist advice

Do you want to receive printed copies of GP Connect or other resources?

Click here to order copies of this newsletter and / or other available resources via our website.