

# Supporting Family Doctors to Green Clinical Care and Clinic Operations - A Scoping Review of Toolkits and Aids to Green Primary Care

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## Introduction

The climate crisis is a healthcare crisis. Left unabated, worsening environmental health will increase major diseases that the health system provides care for. But healthcare also contributes globally to greenhouse gas production, an estimated 4%–7% of total national emissions in developed countries. Many healthcare organizations are committing to green policies, setting targets to support environmentally sustainable healthcare, but much of the focus to date has been on hospitals.

## Context

There is a pressing need for healthcare to respond to the climate crisis. Family physicians, given their central role in community healthcare provision, are strategically placed to lead, support, and promote sustainable healthcare, yet guidance on how to do this is fragmented. Family doctors, challenged by time and resources across most countries, need aids readily available.

## Results

The search identified 17,751 articles. Screening resulted in 20 published articles and 11 toolkits. Most articles presented simple checklists to support greening clinic initiatives, 3 studies focused on partial carbon footprint analyses, and 4 on educational initiatives. Toolkits ranged in sustainability topics and degree of depth covered, and adaptability and outcome measures. None of the resources identified have been formally evaluated for effectiveness.

Table 1. Published Literature: Toolkits & Aids

Author	Aim	Knowledge user: Primary Care Providers	Knowledge user: Specialist Care Providers	Knowledge user: Clinic Managers
Babatunde O (2019) Nigeria	Introduce concept of 'demand-side management (DSM)' and how it can lead to carbon footprint reduction, with a special focus on opportunities in rural health clinic settings. (10, 8)			✓
Barlow RD (2017) US	To inform healthcare resource and material managers on implementing initiatives addressing sustainability. (1, 2, 4, 8, 10)			✓
Blau E (2016) Canada	To motivate and educate the need for greening healthcare and share a primer and checklist for greener family medicine clinics. (1, 2, 3, 9, 10, 12, 13)	✓	✓	✓
Gillam S (2011) UK	Explores what is needed in register training to prepare GPs for role in developing more sustainable healthcare system to protect population health. (1, 2, 3, 7, 8, 13)	✓		
Horton G (2007) Australia	To highlight areas that GPs could engage with patients and the broader community to promote sustainable healthcare, addressing individual and environmental health simultaneously. (2, 3, 4)	✓		
Megzamen (2011) US	To review effects of three environmental contaminants and discuss ways pediatricians can act as individuals and through advocacy to impact these. (4, 9)		✓	
Murchie P (2007) UK	To evaluate the environmental impact of a complete healthcare intervention and determine if evidence supports a primary care, GP follow-up model for melanoma. (3)	✓		✓
Nicolet J (2022) Switzerland	To quantify the average carbon footprint of a primary care consultation, describe differences between primary care practices (best/worst/average performing) in western Switzerland and identify opportunities for mitigation. (2, 3, 4, 8, 10, 12)	✓		✓
Phipps R (2011) New Zealand	Provide an overview of climate change-related impacts in New Zealand and tips to green general practice. (2, 3, 4, 8, 9, 10, 12)	✓		✓
Podein R (2010) US	To introduce concepts of sustainability, give practice pearls and resources for physicians and clinic managers. (2, 6, 8, 9, 10, 11)	✓	✓	✓
Last R (2021) UK	To introduce environmentally conscious respiratory disease management to providers, with inclusion of environmental contributors, diagnosis management and medication choices. (2, 6, 8, 10, 11, 12)	✓		✓
Tait P (2018) Australia	To introduce GPs to heart-related morbidity and mortality and present a model to help guide clinical care and prevention including primordial (societal level advocacy activity), primary and secondary prevention. Illustration through case study. (3, 4, 9, 10)	✓		
Ulrich N (2010) 2010	Discuss why doctors need to be conscious of the environment and offer suggestions for implementing eco-friendly behaviours into their medical practices. (2, 4, 9, 10, 13)	✓		✓
Walsh C (2018) UK	To determine the environmental impact, carbon footprint of completing e-learning for continuing professional development. (1, 10)	✓		✓

## Objective

To identify and evaluate toolkits and aids on sustainable healthcare to act as a curated resource for family physicians and their care teams interested in delivering evidence-based sustainable healthcare in their clinical practices (clinic operation and/or adaptation of clinical care).

## Methods

A scoping review was completed of the published and grey literature across 4 databases and 2 search engines to identify articles and aids/toolkits from 1990 to present. The protocol is available on the Open Science Framework, osf.io/xp4t3. Toolkits were subsequently evaluated for purpose, evidence-base, implementation process, adaptability to family medicine, and outcome measures.

Table 2. Published Literature: Interventions

Author	Aim	Knowledge user: Primary Care Providers	Knowledge user: Specialist Care Providers	Knowledge user: Clinic Managers
Floss M (2021) Brazil	Describes the course creation and development and assesses impact of the PH MOOC. (1)	✓	✓	✓
Fogarty A (2008) Australia	To determine if an environmental educational program for general practitioners would lead to changes in sustainability within their practice. (1)	✓		✓
Kay VA (2020) Australia	To investigate the effectiveness of a primary care health promotion project that addresses environmental sustainability and equity within primary care partnerships. (1, 2, 4, 8, 9, 10)	✓		✓
Nichols A (2011) UK	Survey to examine how successful action plans reduce carbon emissions as created and delivered by primary care trusts (PCTs). PCTs were abolished in 2013. (2, 3, 4, 9, 10, 12)	✓		✓
Pedley C (2019) US	Assess benefits of a community garden established by a medical clinic situated in a food desert. (7, 8)	✓		✓
Pistoll C (2017) Australia	To explore GPs' ideas around active transport and its promotion. (5)	✓		✓

Table 3. Toolkits Supporting Greening Clinical Care

Toolkit Name/ Country	Clear purpose	Evidence-based Elements	Detailed Implementation Process	Adaptation to Family Practice	Evaluation Component to Study Effectiveness and Success	Knowledge user: Primary Care Providers	Knowledge user: Clinic Managers
Climate Change Toolkit/ United States	2, 3, 4, 5, 8, 9, 10, 12	✓	✓	Short list of greening tips. Refers reader to My Green Doctor for detailed implementation.		✓	
Climate Change Toolkit for Health Professionals/ Canada	1, 3, 4, 5, 8, 9, 10, 12	✓	✓	Module 8 contains information on engaging patients; refers reader to Green Office Toolkit.		✓	
GHG + H2O Green Facility Toolkit/ Canada	3, 4, 6, 9, 10	✓	✓	Hospital Focus, section for small & medium-sized facilities; refers to PHO Smart Hospitals Toolkit.	See Smart Hospitals Toolkit	✓	✓
Green Impact for Health Toolkit/ United Kingdom	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12	✓	✓	Easy to use, comprehensive booklet covers multiple topics, clear objectives, >500 practices; participating Activity logs and archives for individual practice on main site. Tiered approach to interventions so participation can be tailored.	Comprehensive tracking, evaluation and reporting methods, and awards for implementation.	✓	✓
Green Office Toolkit/ Canada	2, 3, 5, 6, 9, 10, 11, 12	✓	✓	Specific to individual medical practices, comprehensive, 30 pages, no assets (infographics, posters).	Suggestions for tracking energy, water, and waste.	✓	✓
Greener Practice Asthma Toolkit/ United Kingdom	1, 2, 6, 13, 11	✓	✓	Part of Green Practice, UK-based primary care sustainability network. Provides useful assets, QI project support, links to Center for Sustainable Healthcare for education.	Comprehensive quality improvement project support.	✓	✓
Greening General Practice A Toolkit for Sustainable Practice/ New Zealand	2, 3, 4, 6, 8, 9, 10, 11, 12	✓	✓	Specific to individual medical practices. Comprehensive, 40 pages, no assets.		✓	✓
My Green Doctor/ United States	2, 3, 4, 6, 8, 9, 10, 11, 12	✓	✓	Specific to individual medical practices, extensive resources, easy to implement by beginning with minimal time commitment during medical staff meetings. Tiered approach to interventions so participation can be tailored.	Suggestions for tracking energy, water, waste, cost savings.	✓	✓
Practice Greenhealth/ United States	1, 2, 3, 4, 5, 6, 8, 9, 10, 12	✓	✓	Website that provides a variety of resources and case study examples. Specific membership is required for particular resources and special registration is available for out-patient clinics.	Resources for tracking and auditing.	✓	✓
Smart Hospitals Toolkit/ The Americas region	2, 4, 9, 10, 11	✓	✓	Hospital focus, small + medium-sized facilities operators. Pan-American Health Organization (PAHO) World Health Organization's disaster risk reduction programme.	Resource for tools and tracking cost/benefit analysis programme.		✓
The Greener Respiratory Pathway/ United Kingdom	2, 3, 6, 10, 11	✓	✓	Comprehensive resource directed at primary care with links to many assets. Created by Primary Care Respiratory Society.	Through links.	✓	



## Discussion

The literature identified covered a wide range of topics, with more emphasis placed on clinical operations than direct patient care. All the toolkits identified were free to use and accessible online, and their curation herein as a single resource we anticipate being beneficial for family physicians ready to transition to environmentally sustainable clinical care but without the time to identify resources at hand.

Our review also identified some shortcomings in the literature, including:

- minimal guidance on how to implement change and address barriers to implementation
- minimal capacity for estimating carbon footprinting of various processes and interventions
- none of the resources have been evaluated for implementation or cost effectiveness.

## Conclusion

A range of aids exist to support greening of clinic operations; however, there is a significant gap in the literature for greening clinical care. Two toolkits (leafed above) were found to be comprehensive, one requiring tracking and reporting of sustainability initiatives. This scoping review provides a starting point for motivated family doctors and community clinics to initiate change and support more environmentally conscious and sustainable healthcare.

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## Reference

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