



Patient Empowerment for Sustainable Healthcare: Switching to Carbon Friendly Inhalers

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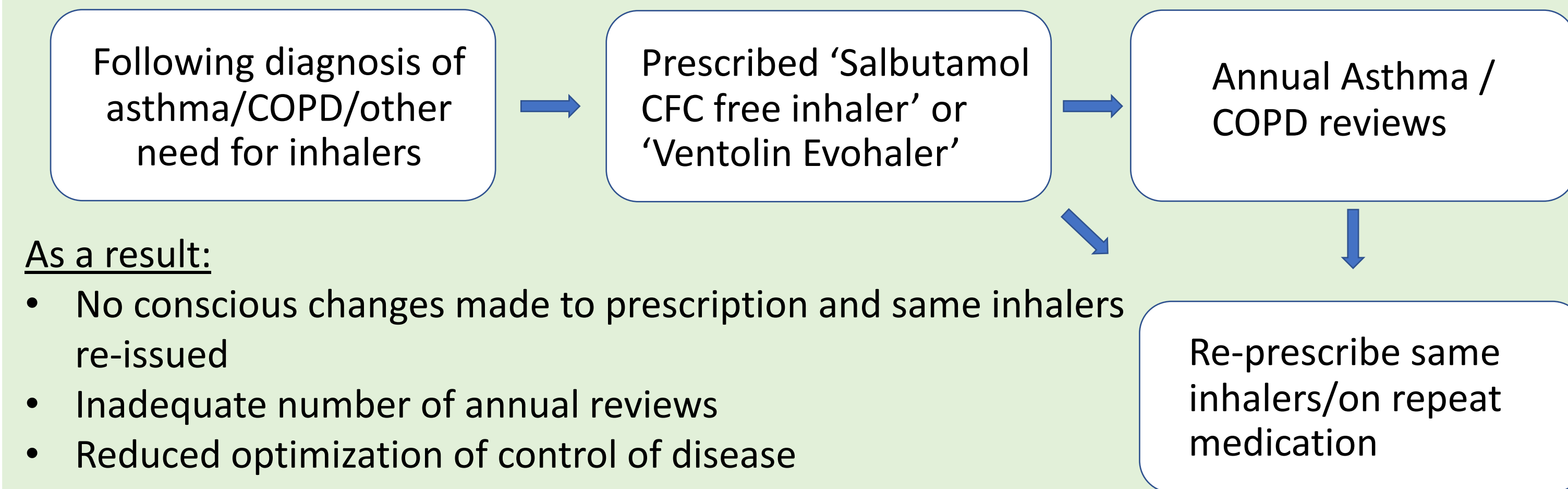
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Background:

‘Climate change is the single biggest health threat facing humanity’ (1). Creating a green medical gaze and incorporating sustainability within healthcare wherever possible is our professional responsibility. Yearly, 61.1 million inhalers are prescribed in Wales, England and Scotland emitting 1,342,923,023kg carbon dioxide equivalent (CO₂e) (2). Switching to ‘Salbutamol chlorofluorocarbon (CFC) free inhalers’, replaced CFCs with potent greenhouse gas hydrofluorocarbons in pressurised metered dose inhalers (3).

What is currently happening at our practice?



As a result:

- No conscious changes made to prescription and same inhalers re-issued
- Inadequate number of annual reviews
- Reduced optimization of control of disease
- Lack of recycling awareness thus increased waste

Aims:

- 1) Switch at least 30% of inhalers of eligible patients to carbon-friendly and cost-efficient inhalers in keeping with NICE guidelines.
- 2) Improve health outcomes by conducting at least 75% of overdue annual reviews.
- 3) Raise awareness of efficient disposal of inhalers.

Methods:

This is a quality improvement project (QIP) of 86 patients found to be suitable for switch to a carbon friendly alternative.

Inclusion criteria: over 12 years old, on pMDIs and with asthma, COPD or another reason for prescribed inhalers.

Exclusion criteria: 17 medically unsuitable, 1 deceased

Intervention:

1. **Planned phone call or annual review** (if due) to 68 patients to propose the eco-friendly option and if interested → **change prescription:** unable to get through to 8, 9 refused, 11 did not attend later appointment
2. **Inhaler switch** to carbon-friendly, cost friendly/neutral option
3. Check **inspiratory flow** if severe disease/>65 years if switching to dry powder inhaler
4. Conduct **annual asthma/COPD reviews**
5. **Education** about **recycling** inhalers

PresQIPP’s guidance (2) used to identify appropriate switches according to carbon footprint and liaised with the GP pharmacists to establish cost-efficacy and stock availability.

Results:

40 patients

- Of 78 inhalers in total, 51% switched to carbon friendly inhalers
- 100% of patients unaware of recycling methods → verbal education provided

1) Switch to Salamol CFC free inhalers

32 of 37 on short acting beta agonists (SABA) switched to ‘Salamol CFC free’ that contains salbutamol

Of those not switched: 2 unwell, 3 declined

Total saving: 505,740g CO₂e
Total cost saving: £1.24 (£0.04 per inhaler)

Switch to	Carbon saving (grams)
Fostair NEXThaler 100/6 (n=2)	20708
Fostair NEXThaler 200/6 (n=4)	53052

Figure 3: Total carbon footprint by switching

3) Switch to Easyhaler Beclomatasone (n=1): Total 19,740g CO₂e and £3.48 saving

- Total CO₂e saved: **599,240g**
- At no additional cost, total money saved: **£3.52**

Annual reviews:

- Conducted on 21 of 26 (80.8%) overdue patients
- 29% of patients (n=21) requiring medication changes due to suboptimal disease control

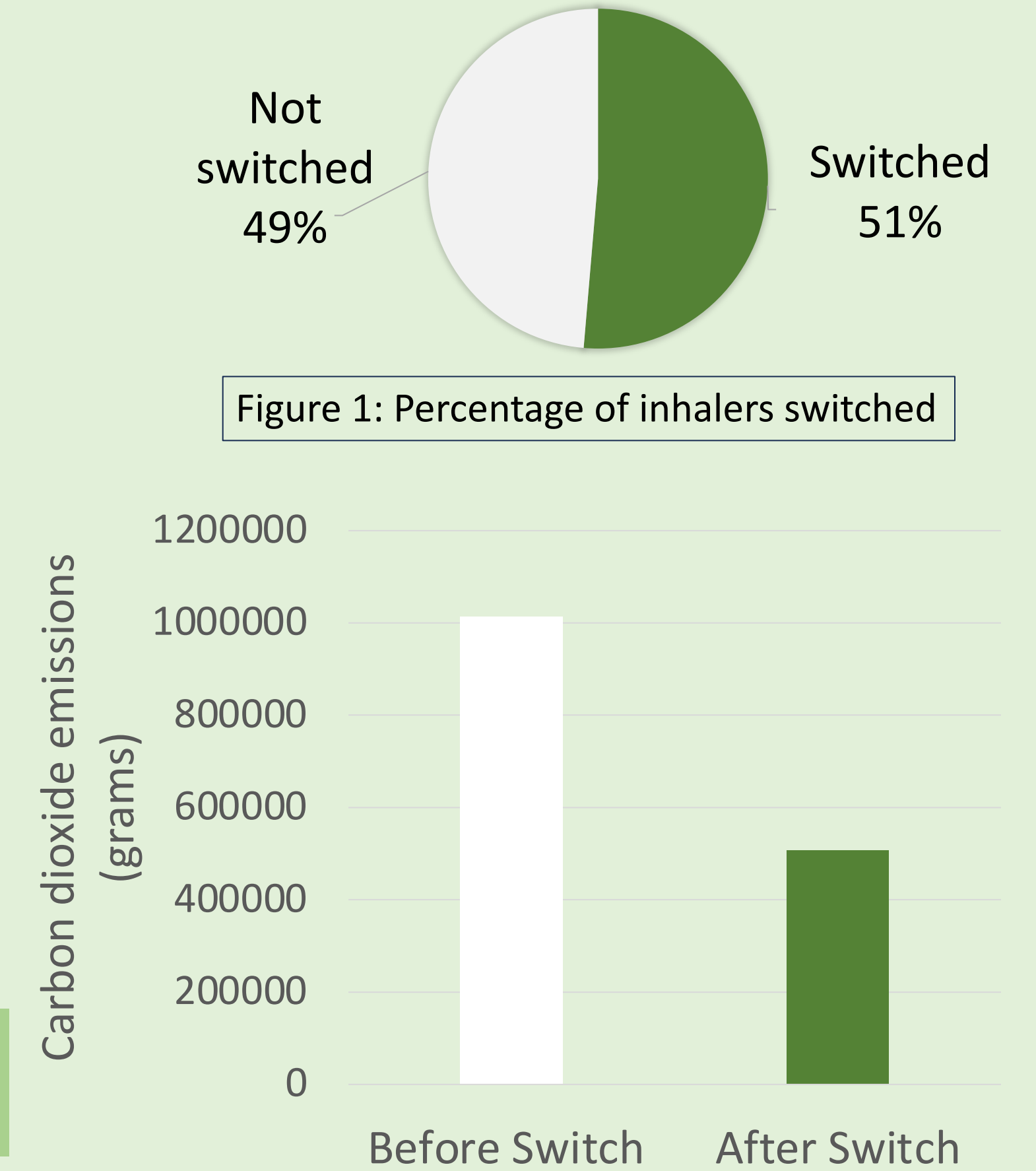


Figure 2: Total carbon footprint before and after switching

2) Switch to Fostair NEXThalers

6 of 9 patients switched to Fostair NEXThaler. Of those not switched: 1 failed inhaler check as unwell, 1 uncontrolled asthma, 1 not eligible as uses spacer

Total saving: 73,770 CO₂e
Total cost saving: £0 (no price difference)

Discussion:

We successfully transitioned many patients to carbon friendly inhalers, with long term implementation promising compounded CO₂e and cost savings. Whilst increasingly adopted in primary care, we included inhaler switch as well as patient involvement and annual follow-up, yielding multifaceted benefits:

- 1) Through a **shared decision-making (SDM)** approach, patients were empowered with the information and choice to make an active change regarding their treatment in view of the environmental impact, which further improved doctor-patient rapport through collaborative discussion. The SDM model is particularly beneficial in tackling the health inequalities (4) evident within our population.
- 2) Given the low socio-economic status of patients, many were existing smokers, had co-morbidities and yearly reviews were up to 4 years overdue. Nearly one third of conducted reviews required changes in medication due to poor control. The QIP provided the opportunity to give lifestyle advice and **optimise disease control**, which ultimately will reduce salbutamol reliever overuse, of which high use represents suboptimal disease.
- 3) Increased carbon emissions lead to global warming and air pollution, which exacerbates physical and mental health, thus the QIP acts as a **preventative step** also.

Challenges and suggestions:

- Volume of patients not attending booked appointments, difficulty contacting them, and the time spent doing so could benefit from Accurx text message to enhance future engagement.
- During their review, patients were asked about the number of inhalers used annually. Whilst this reflects disease control, it also includes number of inhalers wasted due to over-prescription and over-ordering, which could have been further addressed.
- 100% of patients received verbal recycling education. A leaflet may yield better results (5)
- Given the rapid turnover of trainees in our general practice, efforts e.g posters could improve retention of information to ensure continuity of this management.

Conclusion:

We have achieved all our objectives. The QIP has demonstrated promising outcomes in reducing environmental impact and healthcare costs, while simultaneously improving patient outcomes through annual reviews. By incorporating a patient-centred healthcare model, we empowered patients to be involved for their management and its environmental consequence.

References:

1. Climate change and health [Internet]. World Health Organization; 2021 [cited 2023 Sept 26]. Available from: <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
2. Inhaler Carbon Footprint Bulletin [Internet]. Presquipp; 2021 [cited 2023 Sept 26]. Available from: <https://www.presquipp.info/umbraco/surface/authorisedmediasurface/index?url=%2Fmedia%2F5719%2F295-inhaler-carbon-footprint-22.pdf>
3. Jeswani HK, Azapagic A. Life Cycle Environmental Impacts of inhalers. Journal of Cleaner Production. 2019;237:117733.
4. Durand M-A, Carpenter L, Dolan H, Bravo P, Mann M, Bunn F, et al. Do interventions designed to support shared decision-making reduce health inequalities? A systematic review and meta-analysis. PLoS ONE. 2014 Apr 15;9(4).
5. Johnson A, Sandford J, Tyndall J. Written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home. Cochrane Database of Systematic Reviews. 2003 Oct 20;