REDUCING THE INHALER BLUES, MEDICINES OPTIMISATION TEAM

TEAM MEMBERS:

- Pharmacists - Lowri Davies, Lowri Jones, Mair Davies and Rebekah Rogers
- Pharmacy Technician - Sian Jenkins
- Also recognising the co-operation from the Borth Surgery team

Background:

The NHS Wales Decarbonisation Strategic Delivery Plan, launched in March 2021, sets out NHS Wales' plan for addressing the climate emergency declared by Welsh Government in 2019. Part of this plan focuses on the decarbonisation of inhalers. Wales has an ambitious target to reduce the proportion of metered dose inhalers (MDIs) from 70% to less than 20% by 2025, which, if achieved will reduce the amount of CO_2 equivalent (CO2e) released into the atmosphere by 45,000 tonnes each year[1].

Hydrofluorocarbon/hydrofluoroalkane propellants from MDIs contribute 3.5% of the total carbon footprint of the NHS. This amounts to 65,000 tonnes of CO2e each year in Wales alone. Dry powder inhalers (DPIs) have a carbon footprint 18 times lower than MDIs and clinically, DPIs have been proven to be as effective as MDIs[2].

Currently, MDI use in Hywel Dda University Health Board (HDUHB) accounts for 63% of all inhalers prescribed, whereas DPIs account for only 37%[3]. There is clearly a scope to increase the proportion of lower global warming potential inhalers prescribed within HDUHB. The health board has set a target to reduce MDI use to 25% by December 2024 and increase DPI use to 75% or more.

Current data demonstrates that Ventolin® Evohaler or generic Salbutamol inhaler MDIs are by far the most prescribed inhalers, with more than 100,000 devices prescribed and dispensed in primary care in Wales every month. In combination, they contribute to about 66% of the total inhaler carbon footprint each year[2]. Equally effective alternatives exist which can reduce the carbon footprint by 50% (Salamol® MDI) or 98% (any short-acting beta-agonist (SABA) DPI). These inhalers are commonly known by patients as "blue inhalers" thus explaining the title of our project.

The Medicines Optimisation team support practices with their prescribing needs and ensure that they prescribe in line with local and national guidelines, and within the recommended formulary. We have local and national guidelines, patient apps and educational modules which address the green agenda and support inhaler switches to DPIs.

Specific Aims:

Within the ten-week competition period, our aim is to reduce the carbon footprint of MDI inhalers being prescribed within one practice in HDUHB by changing appropriate patients from high carbon footprint MDIs to lower carbon footprint MDIs or DPIs as appropriate.

Approach:

Studying the system:

Borth is a GP practice located in West Wales and has a patient population of 2666. Latest HDUHB data for DPI prescribing shows that Borth is the lowest prescriber of DPIs, (Only 25.79% of all inhalers prescribed are DPI) and they are also the highest prescriber of Salbutamol MDIs in Ceredigion[4]. The practice has a newly appointed practice pharmacist, a trainee pharmacist, a GP registrar, and medical students who were all eager to engage with the project and recognised the need to change their current prescribing practices.

The Medicines Optimisation team conducted a search of Vision; the practice's clinical record system, to find patients who were currently prescribed Salbutamol MDIs (branded or generic) as these have been identified as having a high carbon footprint. From these, we risk stratified the high-risk patients as detailed below, in order to assist the practice to prioritise patients for a face-to-face respiratory review. We met with the practice team and agreed how best to carry out the project. We decided that the project would have two work streams:

Work stream 1: Low carbon inhaler switch

- Medicines Optimisation team would carry out changing the Ventolin® and generic Salbutamol inhalers from high carbon MDIs to Salamol®, a lower carbon MDI. This would result in a decrease of 16kg CO2e per inhaler changed.
- Medicines Optimisation team would reduce the number of inhalers issued per repeat to 1 as per practice request. This should reduce the number of SABA's being prescribed for patients unnecessarily, which in turn will decrease the carbon footprint and reduce wastage.

Work stream 2: Reducing exacerbations

The Medicines Optimisation team would alert the surgery of high-risk patients, deemed to be at an increased risk of respiratory exacerbations due to either:

- being prescribed a high number of SABA MDIs in the last 12 months (≥12 in 12 months)
- being prescribed oral steroids in the last 6 months to treat a respiratory exacerbation
- being prescribed a SABA inhaler without an inhaled corticosteroid inhaler (ICS)

The patients identified would be contacted by the practice to attend a respiratory review where the intention was to agree a plan to better manage their condition. The aim of the review was to reduce the number of SABAs being prescribed, reduce GP & hospital visits due to poor respiratory disease management, provide better quality of life for the patient, and potentially reduce their carbon footprint by changing their inhalers to either lower carbon MDIs or to DPIs.

The medicines optimisation team assisted work stream 2 by:

- producing a green project respiratory review flowchart that was shared with healthcare professionals at the surgery and used during patient reviews *(see appendix 1)*

- producing a patient information leaflet that was provided to patients at their reviews, explaining the benefit of changing their inhalers from MDIs to lower carbon MDIs or DPIs *(see appendix 2)*

The Medicines Optimisation Team held an initial meeting with the practice at which the practice manager, pharmacist, trainee pharmacist, medical students, and GP registrar were in attendance. We discussed our proposal for the project and listened to their ideas and concerns. We outlined how the Medicines Optimisation team and the practice team could work together on the project. As a Medicines Optimisation team, we currently support practices with all aspects of prudent prescribing to ensure that they are prescribing the most clinically appropriate and cost-effective medication. We have remote access to all clinical systems and are trained to aid practices with all aspects of clinical work, thus making us ideally placed to assist the practice with this project work. All concerns were addressed, and some changes made to our proposal in line with the practice's request.

From this initial meeting we invited the respiratory interface nurse to the practice to offer support with the project work and upskill the clinicians. The clinicians felt that they needed some initial support from the Respiratory Interface Nurse on how to carry out a respiratory review. Some clinicians were new to respiratory reviews, and some felt they needed a refresher. The Respiratory Interface Nurse was able to offer support and guidance on how to carry out a successful respiratory review and was also able to offer shadowing of reviews and support to discuss complex cases. Educating staff about the various inhaler types should help them make informed decisions regarding changing inhalers and encourage lower carbon producing inhalers to be considered**.**

We continued weekly meetings throughout the project to address any concerns and keep the practice updated with the project development.

Measurement (Both work streams):

Environmental sustainability:

- We compared the CO2e of all MDIs at the start of the project with the CO2e once changed to lower carbon MDIs or DPIs. This included all the changes made from Ventolin®/generic Salbutamol to Salamol® (209 patients were identified as being on generic or branded Salbutamol MDI), as well as any changes made as a result of the face-to-face reviews carried out by the practice. The CO2e of all inhalers was taken from the MIMS online inhaler carbon emissions tool [5]

Economic Sustainability:

- We calculated the financial impact of any inhaler changes made. This included the changes to Salamol® MDIs as well as any changes made during the face-to-face respiratory reviews. We used the Drug Tariff prices per inhaler[6].

Patient Outcomes:

- We aim to improve the management of patients' respiratory conditions through education and change of treatment if required.
- We hope by assisting the practice to risk-stratify and identify appropriate patients for reviews the practice will be able to offer patient–centred care in a timely manner to the most high-risk patients. This is in line with the "Why Asthma Still Kills" National Review Asthma deaths (NRAD) 2014[7] report which recommends that all asthma patients who have been prescribed more than 12 SABA's in last 12 months be invited for an urgent review of their asthma control.

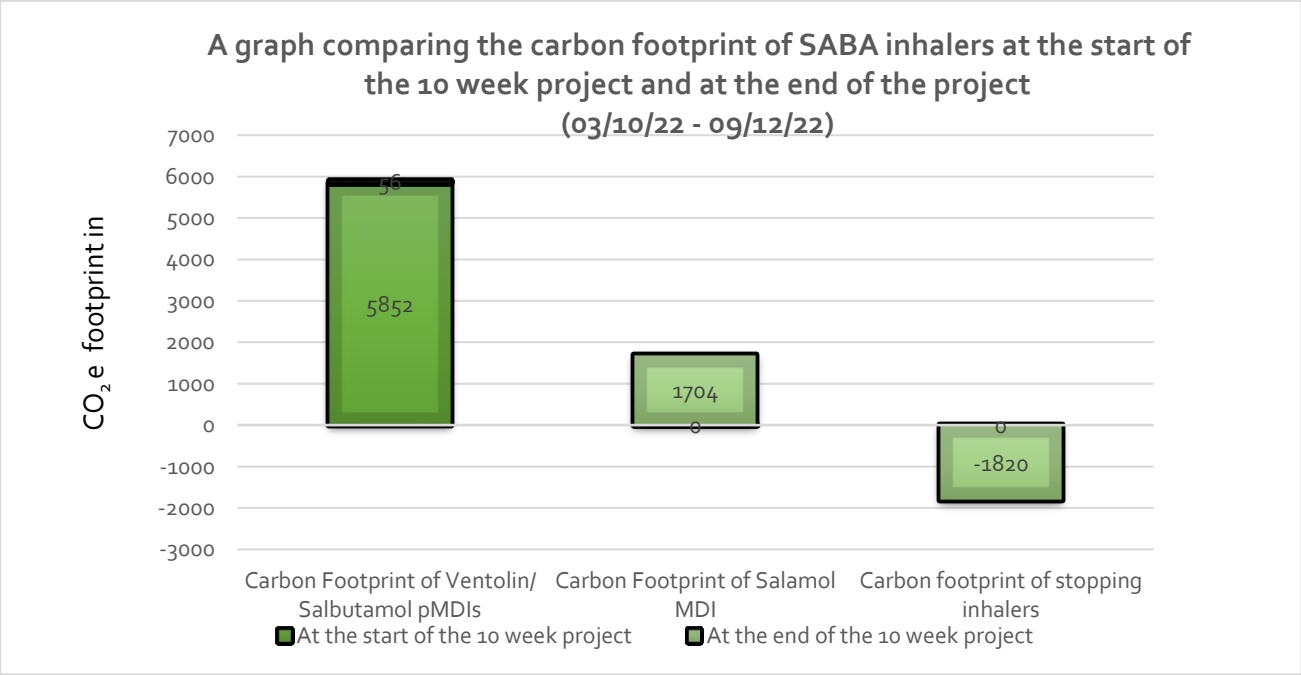
Social sustainability:

- We hope to increase patient awareness of the environmental issues of MDIs
- Having face-to-face respiratory reviews means that high risk individuals could potentially be better managed therefore freeing up GP/clinician time to see more patients.
- Reducing the quantity of medications on repeat, should reduce medicine wastage by patients. From a practice perspective, having less medication on repeats means that there are less for administration staff to process every month, less prescriptions for the GP to sign and less prescriptions for the local community pharmacy to dispense.

Results: Workstream 1: Low carbon inhaler switch

Prescribing at the start of project	Changes implemented over the 10 weeks	Environmental Impact - CO2e savings	Financial impact - £ saved
209 patients prescribed Ventolin® or generic Salbutamol	142 changed to Salamol®	Ventolin® Evohaler = 28kg CO2e, Salamol® inhaler = 12kg CO2e Reduction of CO2e is 28kg - 12kg = 16kg CO2e per inhaler 142 x 16kg = 2272kg of CO2e On average each patient would receive 6 inhalers per year 2272kg x 6 = 13,632kg CO2e	Cost saving of £0.04 per inhaler changed = 142 x 0.04 = £5.68 saved for the practice per month. On average patients would receive 6 inhalers per 12 months: £5.68 x 6 = £34.08 saving per year
	65 taken off repeat	If all patients were to have had only one inhaler in the last 12 months this would be a reduction of 65 x 28kg = 1,820kg of CO2e /12 months.	With each inhaler costing £1.50 this means that the practice would also save 65 x £1.50 = £97.50 per year.
	2 stayed on Ventolin®. *These patients were identified as requiring Ventolin by brand as respiratory symptoms worsened when a switch attempted in the past, therefore it was clinically appropriate for these to remain on branded Ventolin®.*	No saving	No financial impact
10 patients were given 2 Ventolin® inhalers per supply	10 patients were changed to receive 1 Salamol® inhaler per supply	The CO2e saving from 2 x 28kg CO2e inhalers to 1 x 12kg CO2e inhaler = 56kg – 12kg = 44kg CO2e reduction per inhaler per month Over 12 months (if they were supplied with 2 inhalers on 6 occasions throughout the year) this would equate to: 6 x 44kg = 264kg CO2e saved	Reducing from 2 inhalers to 1 inhaler is a cost saving of £1.50 per supply. Over 12 months (if they were supplied with 2 inhalers on 6 occasions throughout the year) this would equate to: 6 x £1.50 = £9.00

		For 10 patients this would be a total of 2640kg CO2e saved	For 10 patients this would be a total of £90.00 saved
1 patient was receiving 4 Ventolin® inhalers per supply	Patient changed to receive 1 Salamol® inhaler per supply	The CO2e saving from 4 x 28kg CO2e inhalers to 1 x 12kg CO2e inhaler = 112kg – 12kg = 100kg CO2e reduction per inhaler per month. Over 12 months (if they were supplied with 4 inhalers on 6 occasions throughout the year) this would equate to: 6 x 100kg = 600kg CO2e saved.	Reducing from 4 inhalers to 1 inhaler is a cost saving of £4.50 per supply. Over 12 months (if they were supplied with 4 inhalers on 6 occasions throughout the year) this would equate to: 6 x £4.50 = £27.00
Total savings from changes made in project period		**18,692 kgCO2e**	**£248.58**
Health Board wide potential if switch was replicated across HDUHB		147,964 SABA MDIs are prescribed in primary care in HDUHB per year. If 95% were changed to Salamol®: 140,565 x 16kg = **2,249,053 Kg CO2e saved per year. This is equivalent to 6.4 million miles driven in an average car.**	Current cost is £1.50 per inhaler, Salamol® cost is £1.46 = cost saving of £0.04 per inhaler changed. Changing to Salamol® would be an estimated cost saving of 140,565 x £0.04 = **£5,623 per year.** **95% switch = £5,623,** **80% switch= £4,735,** **50% switch = £2959**



Number of high-risk patients identified by Medicines Optimisation team and highlighted to GP practice:

- No of patients on ≥12 SABA in 12 months: 32
- No of patients on SABA with no ICS: 27
- No of patients on SABA who've had a course of oral steroid in last 6 months: 10
- A clinical pharmacist from the Medicines Optimisation team reviewed these 69 patients and highlighted the most high-risk patients for the practice to review.
- 6 face-to-face respiratory reviews have been conducted to date

  (Practice challenges with staff annual leave, need for staff upskilling and Respiratory Nurse not being available until week 9 of project)

Results: Workstream 2: Reducing exacerbations

Prescribing at the start of project	Changes implemented over the 10 weeks	Environmental Impact - CO_2 savings	Financial impact – money saved
Patient 1: Sirdupla® 25mcg/250mcg inhaler and Salamol® 100mcg inhaler	Salbutamol 200mcg Easyhaler® and Beclometasone 200mcg Easyhaler®	Sirdupla® 25mcg/250mcg to Beclometasone 200mcg Easyhaler® = 19.6kg – 0.6kg = 19kg CO2e saving Salamol® 100mcg to Salbutamol 200mcg Easyhaler® = 12kg – 0.6kg = 11.4kg CO2e saving If the patient were to receive their ICS inhaler 12 times a year and their SABA inhaler 6 times per year (19kg x 12) + (11.4kg x 6) = 296.4Kg CO2e saved per year	Sirdupla® 25/250mcg inhaler = £29.32 Beclometasone 200mcg Easyhaler® = 14.93 £29.32 - £14.93 = £14.39 saved Salamol® 100mcg inhaler = £1.46 Salbutamol 200mcg Easyhaler® = £6.63 £6.63 - £1.46 = £5.17 increase in price If the patient were to receive their ICS inhaler 12 times a year and their SABA inhaler 6 times per year £14.39 x 12 = 172.68 £5.17 x 6 = £31.02 £172.68 - £31.02 = £141.66 saved
Patient 2: Salamol® 100cmg inhaler and Clenil® 100mcg inhaler	Salbutamol 200mcg Easyhaler® and Beclometasone 200mcg Easyhaler®	Salamol® 100mcg to Salbutamol 200mcg Easyhaler® = 12kg – 0.6kg = 11.4kg CO2e saving Clenil® 100mcg to Beclometasone 200mcg Easyhaler® = 16.5kg – 0.6kg = 15.8kg CO2e saving If the patient were to receive their ICS inhaler 12 times a year and their SABA inhaler 6 times per year (11.4kg x 6) + (15.8kg x 12) = 258Kg CO2e saved per year	Salamol® 100mcg inhaler = £1.46 Salbutamol 200mcg Easyhaler® = £6.63 £6.63 - £1.46 = £5.17 increase in price Beclometasone 200mcg Easyhaler® = 14.93 Clenil® 100mcg inhaler = £7.42 £14.93 - £7.42 = £6.97 increase in price If the patient were to receive their ICS inhaler 12 times a year and their SABA inhaler 6 times per year

			(£5.17 x 12) + (£6.97 x 6) = £103.86 increase in price
Patient 3: Sirdupla® 25mcg/250mcg inhaler	DuoResp Spiromax® 160mcg/4.5mcg	Sirdupla® 25mcg/250mcg to DuoResp Spiromax® 160mcg/4.5mcg = 19.6kg – 0.6kg = 19kg CO2e saving If the patient was to receive their ICS inhaler 12 times per year 19kg x 12 = 228kg CO2e saved per year	Sirdupla® 25/250mcg inhaler = £29.32 Duoresp Spiromax® 160mcg/4.5mcg = £28.00 £29.32 - £28.00 = £1.32 saved If the patient were to receive their ICS inhaler 12 times per year £1.32 x 12 = £15.84 saved
Patient 4: Trelegy Ellipta® and Salamol® 100mcg inhaler	Fostair® 100/6 Inhaler and Salamol 100mcg inhaler (Patient changed from DPI to MDI due to poor inspiratory effort)	Trelegy Ellipta® = 0.77kg CO2e Fostair® 100/6 inhaler = 11.25kg CO2e 11.25kg – 0.77kg = 10.48kg Increase in CO2e Salamol® unchanged If the patient was to receive their ICS/LABA inhaler 12 times per year 10.48kg x 12 = 125.76kg CO2e increase per year	Trelegy Ellipta® = £44.50 Fostair® 100/6 inhaler = £29.32 £44.50 - £29.32 = £15.18 Salamol® unchanged If the patient was to receive their ICS/LABA inhaler 12 times per year £15.18 x 12 = £182.16 saved per year
Patient 5: Treatment not altered – Inhaler technique adjusted and referred for GP review			
Patient 6: Clenil® 100mcg inhaler and Salbutamol 100mcg inhaler	Fobumix Easyhaler® – MART regime	Clenil® 100mcg inhaler and Salbutamol 200mcg inhaler = 16.5kg + 28Kg = 44.5kg CO2e Fobumix Easyhaler® 160/4.5mcg = 0.48kg CO2e 44.5kg – 0.48kg = 44.02kg CO2e saving If the patient was to receive their ICS MART inhaler 12 times per year 44.02kg x 12 = 528.24kg CO2e saved per year	Clenil® 100mcg inhaler and Salbutamol 200mcg inhaler = £7.42 + £1.50 = £8.92 Fobumix Easyhaler® 160/4.5mcg = £28.00 £28.00 - £8.92 =£19.08 increase in price If the patient was to receive their ICS MART inhaler 12 times per year £19.08 x 12 = £228.96 increase in price
Total savings from changes made in project period		**1,436.34 kgCO2e**	**£6.84**

CO2e figures taken from MIMS[5], Drug Costs taken from the Drug Tariff[6]

Patient Outcomes for both workstreams:

No qualitative data from patients was collected during this project as very few respiratory reviews were undertaken by the practice due to numerous factors e.g., the relatively short period of the project made identifying and booking a patient for reviews a challenge. The practice also identified that they needed the support of the Respiratory interface Nurse to assist with reviews and therefore this decreased the number of reviews possible within the project time frame.

Feedback from clinicians undertaking the reviews was that the patients who attended the practice for a face-to-face respiratory review felt that they really benefitted from the review. Many had not been seen face-to-face for many years due to recent COVID rules and therefore were grateful for the opportunity to speak directly with a clinician. Patients felt that their respiratory needs were being met and that they were offered the most appropriate inhaler currently available. Patients were also given a patient information leaflet during the review (Appendix 2) and felt that they had a better understanding of the carbon impact of inhalers after reading this.

Clinicians felt that face-to-face respiratory reviews were beneficial for patients as they could review inhaler technique and ensure that the patient was receiving the most appropriate inhaler for them, ensuring optimal disease management thus making the review extremely patient focused. Improved respiratory condition management should reduce the time lost from education or work, improve health and wellbeing, and improve patients' quality of life.

We hope that the practice continues to carry out respiratory reviews with the identified high-risk patients and we'll be in regular contact with them to obtain both patient and clinician feedback on the reviews and potential inhaler changes.

Going forward, as a Medicines Optimisation team we will be able to gather specific data for the practice using our CASPA database. We will have access to data detailing the number of SABA's prescribed monthly, as well as the number of DPIs prescribed. We will therefore be able to monitor if the project has had a long-lasting effect on prescribing within this practice. We predict that having assisted the practice to prioritise their high-risk patients who do not have well controlled respiratory conditions, and by forging close working relationships between the Respiratory Interface Nurse, the Medicines Optimisation team, and the practice, we will see reductions in unnecessary SABA prescribing and a positive shift towards DPI prescribing over the next 12 months.

Social sustainability; benefit to patients, health board staff and the community

The social impact from face-to-face respiratory reviews, optimising respiratory disease management and potentially changing patients' inhalers from MDIs to DPIs are vast.

The "Why Asthma Still Kills" (NRAD) report 2014[7] recommended actions for primary care to reduce asthma deaths and the work streams in this project align with these recommendations, giving clinical benefit whilst also aiming for decarbonisation. One of the recommendations noted was that all patients who had been prescribed more than 12 reliever inhalers in a 12-month period were invited for an urgent review of their asthma, with a view of improving their asthma through education and a change of treatment. We have adopted this recommendation as part of our project with the goal of ensuring that high-risk individuals have better control of their respiratory condition, require less GP/clinician appointments which in turn could free up GP/clinician time to see other patients. Improved control should also lead to less frequent exacerbations, reducing the risk of A+E attendances for uncontrolled asthma. Unfortunately, 10 weeks isn't long enough for us to measure these outcomes.

Improved respiratory control will also lessen the need for short courses of corticosteroids and antibiotics. This in turn will contribute towards lowering antibiotic resistance for both the patient themselves and the wider population.

Reducing the quantity of medications on repeat means there will be less wastage from patients who may be ordering medications when not required. From a practice perspective, having less medication

on repeats means that there are less for administration staff to process every month, less prescriptions for GPs to sign and less prescriptions for the local community pharmacies to dispense.

The project improved working relationships between the Medicines Optimisation team, the GP practice, and the respiratory interface nurse. Educating the staff about the various inhaler types and the carbon impact of inhalers allowed more informed decisions to be made and encouraged lower carbon producing inhalers to be considered. We also saw an improved awareness of decarbonisation and the green agenda by the multidisciplinary practice team. Staff have applied this new knowledge to their working day, for example administration staff at the practice now routinely query a request for a SABA inhaler from a patient and assign it to a clinician for review, rather than issue the prescription immediately. We have received positive feedback from all teams within the surgery, from reception and administration staff to the clinicians and practice manager. They were all keen to be involved with the work and enthusiastic to reduce the carbon footprint of the practice.

The project demonstrated how the Medicines Optimisation team can work collaboratively with a GP practice in order to prioritise high-risk patients for review. In this project, from the patients prescribed SABA's we risk stratified patients for respiratory reviews by clinicians, thus ensuring more efficient working. This is also in line with prudent prescribing principles as the correct patient was seen by the most appropriate clinician in the most appropriate time frame. The project has shown that by assisting the practice to risk- stratify and identify appropriate patients the practice is able to offer more patient-centred care in a timelier manner.

The Medicines Optimisation team are now more confident to approach further practices to discuss decarbonisation and potentially offer similar input. In addition to this, working on this project has sparked conversation within the team of ideas on how to improve sustainability within other aspects of patient care.

Discussion and Conclusion:

Barriers encountered:

The GP surgery encountered some barriers due to the challenges of staffing issues and work commitments. Due to the timing of the project the clinical staff at the surgery were delivering flu and COVID vaccination clinics alongside their usual workload and therefore time for project work was limited. Staff annual leave was also a barrier as we approached December. Unfortunately, the respiratory interface nurse for the health board was unable to help until week 9 of the project which was also a barrier as the practice felt they benefited enormously from her knowledge and expertise in reviewing respiratory patients. Due to all these factors, it was unfortunate that only six patients had attended the surgery for a face-to-face review during the 10-week project period. However, we are confident that with the structure for reviews now in place and high-risk patients identified the surgery team will continue with this work for the foreseeable future.

The practice pharmacist also highlighted a problem with the local community pharmacy where they were over–ordering SABA inhalers or ordering patients' inhalers when they were not needed. He discussed this with the pharmacy owner and training is now in place for new pharmacy staff, which should ensure that correct repeat medication ordering procedures are followed. The practice pharmacist will monitor the problem going forward.

Within the Medicines Optimisation team, project members worked part time at different ends of the week and therefore communication of work was a challenge, as was communicating with the practice due to the pressures mentioned above. We overcame such challenges by designing a project Excel worksheet which was stored on an accessible shared drive for all members of the project to access and update regularly as tasks were completed.

Steps taken to ensure lasting change

What the practice have done and will be doing going forward:

- They have ensured that all practice staff are aware of the SABA reduction drive. Reception staff are now highlighting any SABA inhaler requests to clinicians for review before issuing prescriptions.
- They have established a good working relationship with the health board's respiratory interface nurse who attends the surgery to review complex patients and offer training and support to clinicians.
- They have changed their policy to only have 1 SABA on repeat, and if reviewed by a clinician, SABAs are completely removed from the repeat and all acute requests will then need to be reviewed by a clinician first before issuing.

Medicine Optimisation team:

- Consideration given to rolling out the project to other high MDI prescribing practices within the health board.
- Continue to offer support to Borth GP practice with respiratory inhaler queries as needed.
- Continue to work closely and in collaboration with the respiratory interface nurses.

Consideration of other areas where the medicines optimisation team can impact on the environmental and financial cost of prescribing.

The project was successful in reducing the carbon footprint of MDI inhalers being prescribed within one practice in HDUHB by changing appropriate patients from high carbon footprint MDIs to lower carbon footprint MDIs or DPIs if appropriate. The project shows that intervention from the Medicines Optimisation team in changing inhalers from high carbon to lower carbon alternatives results in a reduction in carbon footprint.

From the health board's perspective, changing patients to the most carbon friendly inhaler where appropriate is in line with both the HDUHB and the national decarbonisation agenda.

It is accepted that, whilst making a carbon footprint reduction, and aligning with local and national decarbonisation targets, changing patients' inhalers from MDIs to DPIs won't always result in cost saving. In most cases changing a patient from 1 MDI to 1 DPI, thereby reducing the carbon footprint of inhalers could be more expensive, depending on which inhalers are appropriate for each patient. However, there will be cost savings if the total quantity of inhalers prescribed is reduced e.g., following better control, reducing the quantity on each prescription to avoid wastage, and when 3 MDI inhalers are changed to 1 DPI with triple therapy incorporated in one device. Cost savings from reduced exacerbations / reduced A+E visits and reduced asthma deaths are very difficult to cost but must be the ultimate goal of this work.

Positive feedback was received from the practice regarding our stratification of high-risk patients. This assisted them to prioritise patients for a respiratory review by the relevant clinician. The Green Project Respiratory review sheet was well received and deemed easy to use by the clinicians. We believe that

we have empowered the practice staff and Medicines Optimisation team members to be more mindful of the environmental and financial impact of prescribing.

All aspects of the project could be replicated in different practices across the health board with potential CO_2 and financial savings. Financial savings will only be achieved if inhaler usage and quantities prescribed are reduced due to better patient management of respiratory conditions.

References and Resources

1. All Wales Medicines Strategy Group. National Prescribing Indicators 2022– 2023: Supporting Safe and Optimised Prescribing. January 2022 (Updated September 2022). [Accessed 07/12/22] Available from: https://awttc.nhs.wales/files/national-prescribing-indicators/national-prescribing-indicators-2022-2023-v3-pdf/
2. Respiratory Health Implementation Group. Green Agenda Sustainable Inhaler Prescribing. April 2022.
3. Welsh Analytical Prescribing Support Unit. Server for Prescribing Information Reporting and Analysis (SPIRA) - Decarbonisation Dashboard. January 2022. [Accessed 07/12/22] Available from: SPIRA - Decarbonisation Dashboard
4. Hywel Dda University Health Board internal prescribing data obtained by Medicines Optimisation Team from the Comparative Analysis System for Prescribing Audit,CASPA.
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6. NHS Business Services Authority. Drug Tariff. December 2022. [Accessed 07/12/2022] Available from: Drug Tariff | NHSBSA
7. Royal College of Physicians. The National Review of Asthma Deaths (NRAD): Confidential enquiry report 2014. May 2014. [Accessed 07/12/22] Available from: NRAD (asthma.org.uk)

Appendix 1

Green Project Respiratory review – High risk patient identified

This should not replace your standard respiratory review procedure

Oral Prednisolone in last 6 months ☐

>12 SABA's in last 6 months ☐

On SABA with no ICS ☐

1. Explain to patient why they have been asked to attend today:
- Explain one of risk factors identified above
- Poor control means that they are at an increased risk of further exacerbations/attacks

Done: Y/N

2. Check Vision/ EMIS clinical system for actual number of inhalers requested in last 12 months
- Although on repeat the patient may be requesting more often (SABA) or less often (ICS) than monthly
- No. of SABA in the last 12 months ……
- No. of ICS in the last 12 months ……
- Discuss high SABA use & encourage regular ICS use

Done: Y/N

3. Explain steps to improve control
- Ask patient "How often have you taken your ICS this week?" Encourage honest discussion
- Reduction in SABA use: take SABA off patient repeat to reduce ordering if appropriate
- Would change of inhaler be appropriate to improve control?

Done: Y/N

4. Discuss carbon footprint of inhalers and suitable DPI alternatives
- Use NICE Asthma patient decision aid: NG80 Asthma inhalers and the environment patient decision aid (nice.org.uk)
- Agree on DPI if appropriate and counsel on inhaler technique (*please see HDUHB inhaler change guide*)
- If DPI unsuitable change SABA to Salamol pMDI to be used with aerochamber

Done: Y/N

5. Promote All Wales Asthma Hub app: Asthmahub – Healthhub
- Mention Inhaler technique videos
- Encourage patient to keep a peak flow diary

Done: Y/N

6. Personal Asthma Plan: Final-asthma-care-plan-english.pdf (icst.org.uk) / Final-asthma-care-plan-welsh.pdf (icst.org.uk)
- Print off and fill in an All Wales Asthma Management plan with patient
- Discuss how to manage exacerbations
- Give patient information leaflet to patient with overview of consultation

Done: Y/N

7. Book follow up in 4 - 6 weeks and contact community pharmacy
- Update patient's community pharmacy on any changes made to inhalers and ensure the patient checks their bag on next collection to ensure they have been dispensed the correct inhalers
- Review new inhaler technique
- Review patient's 2 week peak flow diary
- Current management

Done: Y/N

Please turn over

Outcomes/comments: *(please provide information of any interventions made after patient review i.e., where inhalers changed from pMDI to DPI? Has SABA been taken off repeat?)* **A copy of this form needs to be sent to the HDUHB MM team for data collection**

Appendix 2. Inhalers and climate change posters – Welsh and English versions

Anadlyddion asthma a newid hinsawdd – beth allwn wneud?

Mae nwyon tŷ gwydr pwerus mewn rhai anadlyddion sydd yn helpu cario'r cyffur i'r ysgyfaint. Mae'r nwyon yma yn cyfrannu at newid hinsawdd. Mae yna anadlyddion eraill sydd ddim yn cynnwys nwyon tŷ gwydr.

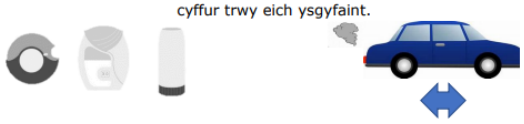
Sut mae'r anadlyddion yn cymharu:

Anadlydd Dôs Mesuredig

Mae un o'r anadlyddion yma yn creu 28kg o CO_2 ,sydd yn cyfateb i'r un faint o CO_2 â thaith **175 milltir** yn y car.

Anadlydd Powdwr sych

Mae un o'r anadlyddion yma yn creu llai na 1kg o CO_2 sydd yn cyfateb i'r un faint o CO_2 â thaith **3 milltir** yn y car. Does dim nwyon tŷ gwydr yn yr anadlyddion yma. Maent yn dibynnu ar eich anadl i wasgaru mân ronynnau'r cyffur trwy eich ysgyfaint.



Y peth pwysicaf am eich anadlyddion yw eu bod yn rheoli eich asthma! Yr anadlydd sydd â'r ôl troed carbon uchaf yw'r un sydd yn cael ei wastraffu!

Peidiwch â thaflu eich anadlyddion gwag i'r bin!

Unwaith yr ydych wedi sicrhau bod yr anadlydd yn wag, ewch ag ef nol i'r **fferyllfa** lle caiff ei waredu yn gywir. Mae hyn yn sicrhau na fydd eich anadlydd yn cyrraedd safle tirlenwi lle fydd y nwyon yn parhau i ollwng o'r ddyfais i'r amgylchedd.

Gwnewch yn siwr i wirio eich anadlyddion y tro nesaf yr ydych yn eu casglu o'r fferyllfa er mwyn sicrhau eich bod wedi derbyn yr anadlyddion cywir.

Asthma inhalers and climate change – what can be done?

Some types of inhalers contain a propellant (gas) to carry the medicine into the lungs. The propellant has a greenhouse gas effect, which contributes to climate change (global warming). Other types of inhalers do not contain propellants.

How inhaler types compare:

Metered dose inhalers (MDIs)

One of these inhalers produces 28kg CO_2 which is the same amount of CO_2 as a **175 mile** car journey.

Dry powder inhalers (DPIs)

One of these inhalers produces less than 1 kg CO_2 which is the same amount of CO_2 as a **3 mile** car journey. This is because they do not contain propellants (gases). They rely on your breath to break up and disperse tiny particles of the medicine through your airways.

The most important thing about your inhalers is that they're controlling your asthma! A wasted inhaler has the highest carbon footprint of all!

Please don't throw your used inhaler in the bin!

Once you are sure your inhaler is empty, please return it to the **pharmacy** for proper disposal. This ensures that it won't end up in landfill where the gases will continue to be released into the environment and will also help with recycling.

Make sure you check your inhalers the next time you collect them from your community pharmacy to ensure you have received the correct inhalers