Clinical indicator:

Reducing the proportion of patients with asthma aged 12+ on a metered dose inhaler compared to a dry powder device.

Why is this important?

NZ Asthma Guidelines were updated during 2020. These reflect the changes in evidence around the benefits of therapies such as maintenance reliever therapy (MART) and anti-inflammatory reliever (AIR). There is evidence to suggest short acting beta agonists (SABAs) on their own increase the risk of asthma exacerbations, worsening airway inflammation and asthma related death.[1]

An inhaled corticosteroid (ICS) should be prescribed to all patients with asthma. For newly diagnosed patients, they should be started on AIR treatment which includes **budesonide/formoterol**.

Pressurised metered dose inhalers (pMDI)s such as salbutamol contain hydrofluorocarbon (HFA) propellants, which are powerful greenhouse gases that contribute to global warming. Hydrofluorocarbons were an improvement on the original propellant in metered dose inhalers ie chlorofluorocarbons (CFCs) which damage the ozone layer. HFAs have no impact on the ozone layer but still have 1,000 times the global warming potential of carbon dioxide. The estimated carbon footprint of one 200 puff salbutamol inhaler is 28kg of carbon dioxide equivalents (CO2- e). This is comparable to, for example, driving approximately 225km between Auckland and Tauranga, assuming average car emissions of 125g. Dry powder inhalers (DPI)s do not use propellants and have a footprint of around 1kg CO2 – e per inhaler[2].

By following the NZ Asthma Guidelines, budesonide/formoterol (Symbicort) is first line where clinically appropriate. Switching to lower impact devices where clinically appropriate, could be a small but significant way healthcare can prevent climate change.

What is the gap nationally?

It was estimated in 2021, that 70 per cent of inhalers prescribed for asthma management nationally were pMDIs.[3] Countries such as Sweden have only 10 per cent of inhalers in use being pMDIs. The reason for this difference is not clear but could be a combination of things such as marketing and patients biases.[4] In Aotearoa New Zealand, as more people move to

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[1] Asthma Foundation (2020) NZ Adolescent and Adult Asthma Guidelines. Available from: www.asthmafoundation.org.nz/health-professionals/management-guidelines/nz-adolescent-and-adult-asthma-guidelines-2020.

[2] Ako hiringa 2023.Inhaler carbon footprint. Available from: www.akohiringa.co.nz/education/inhaler-carbon-footprint.

[3] Asthma foundation 2021 The environmental impact of inhalers. Available from: www.asthmafoundation.org.nz/stories/the-environmental-impact-of-inhalers.

[4] Thorax (2019) Janson C et al. Carbon footprint impact of the choice of inhalers for asthma and COPD.

recommended therapies such as MART and AIR, and there is a reduction in the use of salbutamol, the per centage of DPIs will grow.

What is the gap locally?

Locally (Jan 2025), 45.4 per cent of coded asthmatics aged 12 years and older are using an pMDI cf DPI. 49.1 per cent are Māori and 44.2per cent are non-Māori.

What are we measuring?

Clinical indicator: Reducing the proportion of patients with asthma aged 12+ on a metered dose inhaler compared to a dry powder device.

Source: Respiratory Clinical Dashboard [Quality Improvement Dashboard].

Numerator: Patients with asthma aged 12+ who have been prescribed a pMDI in two or more quarters in the year.

Denominator: Patients with asthma aged 12+ who have been prescribed a pMDI or DPI in two or more quarters in the year.

Definition of asthma: A recorded diagnosis of asthma without an accompanying diagnosis of COPD

Definition of being prescribed a pMDI: In the past four quarters, a patient has been prescribed a pressurised metered dose inhaler two or more different quarters

Definition of being prescribed a DPI: In the past four quarters, a patient has been prescribed a dry powder inhaler in two or more different quarters

How can I use this for the equity and CQI modules of Cornerstone?

He Ako Hiringa has developed a CQI activity that is endorsed by RNZCGP for both the CQI and equity modules within Cornerstone. Your Power BI dashboard can be used to populate the audit. More information can be found here: www.akohiringa.co.nz/education/epic-reflect-audit-asthma.

Other references

- www.nzdoctor.co.nz/article/educate/how-treat/toolkit-2024
- www.nzdoctor.co.nz/article/undoctored/not-only-too-much-salbutamol-bad-people-asthma-its-also-bad-environment
- www.commonwealthfund.org/blog/2023/hidden-contributor-climate-change-asthma-inhalers#:~:text=A%20Greener%20Inhaler&text=HFAs%20were%20an%20improvement%20from,warming%20potential%20of%20carbon%20dioxide
- www.stuff.co.nz/environment/climate-news/131748164/by-switching-inhalers-you-could-reduce-your-planetary-impact
- www.prescqipp.info/umbraco/surface/authorisedmediasurface/index?url=%2fmedia%2f5719%2f295-inhaler-carbon-footprint-22.pdf

- www.nzdoctor.co.nz/article/news/toolkit-2024-part-2-planetary-health-environment-animals-and-humans-all-connected
- www.rnzcgp.org.nz/resources/sustainability/greening-general-practice/

Supplementary information

GINA (2023) available from Ginaasthma.org.