

Increasing Access to Inhaled Medicines for COPD and Asthma

HOT TOPIC

The critical role of spacers in asthma and COPD

What is a spacer?

A spacer is a simple tube that connects to an inhaler giving the medicine a 'space' to slow down for a few seconds so users can breathe it in more slowly and deeply. This enables more medication to be delivered to the lungs while reducing side effects, as less medication is deposited in the mouth and throat.

Using a metered-dose inhaler without a spacer requires perfect timing: pressing the inhaler and inhaling the mist in one seamless action. Many children—especially younger ones—as well as adults especially during an asthma attack, struggle with this coordination.

By significantly improving medication delivery, reducing side effects, and improving control, spacers reduce flare-ups, hospitalizations, and even deaths, along with disability. Better disease control also increases school attendance, exercise, and overall growth in children and improves workforce participation and quality of life for patients with asthma or COPD.

Spacers are not optional—they are essential components of effective asthma management in children, and for asthma or COPD control for many adults.

The World Health Organization (WHO) recommends spacers in the [WHO Package of Essential Noncommunicable \(PEN\) Disease Interventions for Primary Health Care](#) and the [WHO list of priority medical devices](#) for management of cardiovascular diseases and diabetes.

Spacers are strongly endorsed by the [Global Initiative for Asthma](#) (GINA) and by the [Global Initiative for Chronic Lung Disease](#) (GOLD).

Yet, a majority of the 652 million people living with COPD or asthma, including 96 million children under 15 years with asthma, do not have access to spacers.

Most live in low- and middle-income countries (LMICs) across Asia, Africa, and Latin America. Low-cost effective spacers have been made from 500ml plastic soda bottles and can be used if commercially produced devices are unaffordable or unavailable.

To increase access to spacers for these patients, the Forum of International Respiratory Societies (FIRS) is calling on governments, industry, and global health agencies to focus on on five actions as part of the FIRS [Increasing Access to Inhaled Medicines Campaign](#) (Box 1).



Teenager using the AfriSpacer

Why is increasing access to spacers so important?

Superior asthma and COPD control

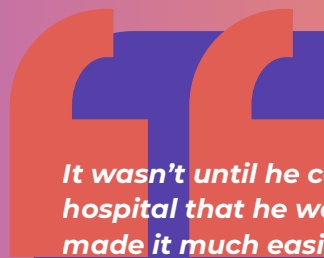
Using an inhaler requires precise coordination: the patient must press down and inhale at the exact same time, which can be challenging for children, as well as adults with poor coordination and during attacks. By ensuring that significantly more medication reaches the lungs and less ends up in the mouth or throat, spacers improve symptom control, speed resolution, reduce flare-ups, hospital visits, and school absences.(1)(2)(3)(4)(5)

Fewer side effects

By limiting how much medicine sticks in the mouth and throat, spacers reduce the risk of oral thrush, sore throat, and hoarseness. Further, studies show that children with asthma using inhalers with spacers had smaller increase in heart and respiratory rate and significantly better pulmonary index scores compared to patients using nebulizers.(6)(7)

Greater patient satisfaction

Patients report satisfaction with using spacers describing faster relief and ease of use as benefits. Families also report that spacers are better tolerated by their children compared to nebulizers.(8)(9)(10)



It wasn't until he came to the teaching hospital that he was offered a spacer. It made it much easier for him to inhale the medicine and it made the symptoms much better.

**Mother of Bright , 12 year old
with asthma, Ghana**

Multiple cost benefits

By increasing the effectiveness of treatment in the community, the use of inhalers with spacers can reduce expensive emergency and inpatient admissions. Studies show a reduction in hospitalization and average inpatient stay for children with asthma who use inhalers with spacers, and significant cost savings for hospitals, the health care system, and families.(11)(12)(13)(14)(15)

Box 1: What can we do to increase access to spacers?

- **Policy:** Include spacers in all global and national asthma and COPD treatment guidelines, essential medicines and medical device lists, and related health policies.
- **Product:** Improve spacer availability by facilitating product registration, incentivizing regional and local manufacturing, and by requiring hospitals and pharmacies to stock spacers.
- **Price:** Reduce the cost of spacers by including them on national health insurance reimbursement lists, by bulk purchasing for the health system, by enabling and using low-cost spacers, and other proven strategies.
- **Primary Care:** Increase training in the effective use of spacers among primary healthcare providers and incentivize clinicians and pharmacists to show patients and their families how to use spacers.
- **Patient Advocacy:** Invest in campaigns to increase patient and family awareness of spacers, and to destigmatize and improve their correct use.

Why are so many children and adults with asthma missing spacers?

Lack of availability

Lack of both inhaler and spacer availability in pharmacies and hospitals has limited adoption in many countries. In a 52-country survey, inhalers were available in fewer than 30% of public pharmacies and hospitals - far short of the WHO target of 80%. A Nigerian study found spacers available in just 20% of tertiary hospitals. Other studies have found more than 1 in 5 children and teenagers with asthma have non-functioning or no spacers.(16)(17)(18)(19)

Limited clinical training

Despite the clear benefits of spacers, studies reveal clinicians are not trained in their use. For example, in a study conducted in a tertiary hospital in India, less than 2% of graduate medical students knew how to use a spacer correctly. This contributes to low prescription rates for spacers in some settings and lack of clinical instruction to families.(20)(21)(22)(23)(24)

Box 2: What are affordable spacer solutions?

- Spacers can be made from plastic drink bottles when manufactured spacers are unavailable or unaffordable.
- Studies, including in LMICs, have tested the efficacy of these low-cost spacers for children with asthma and found comparable drug delivery and improvement in children who have an asthma attack.
- In recent years, there have been efforts to manufacture and sell low-cost spacers in low-resource settings, such as the **AfriSpacer**.
- These no- and low-cost spacers have the potential to remove all of the major barriers to access outlined above.(28)(29)(30)(31)(32)

It's a lot easier to use the spacer than to just have the pump on its own, and it's a lot more effective. When your child goes into hospital it is necessary for somebody to educate you, especially in the correct use of the spacer.

Mother of Imaan, 6 years old with asthma, South Africa

Low community awareness

Limited awareness among patients and their families reduces demand for spacers. Studies have found spacer usage guidelines lacking and that improvements could increase correct usage, especially visual instructions. Older children are also less likely to have a spacer than younger children which may be a result of greater confidence with inhaler use alone, and/or lack of caregiver supervision of children's inhaler use.(25)(26)(27)



Infant using a bottle spacer and mask

Join us!

Join us to secure access to quality, affordable, and effective inhalers for all!

The **Forum of International Respiratory Societies (FIRS)** - the world's leading international professional respiratory societies - is supporting a campaign to improve the availability of quality, affordable, and effective inhalers for COPD and asthma in low resource, high-burden settings.

The campaign is engaging governments, UN and global health agencies, industry, donors, patient advocacy and civil society organizations, and media to support the actions required to transform access to inhaled medicines.

Investing greater resources to meet the urgent need for inhaled medicines now will accelerate achievement of both Global NCD Action Plan targets and the Sustainable Development Goals.

Members of FIRS include:

- American College Chest Physicians
- American Thoracic Society
- Asian Pacific Society of Respiriology
- Asociación Latino Americana De Tórax
- European Respiratory Society
- International Union Against Tuberculosis and Lung Diseases
- Global Initiative for Asthma
- Global Initiative for Chronic Obstructive Lung Disease
- Pan African Thoracic Society



Maxwell, 69 year old with COPD, Nigeria

Contact

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Adult counting to five after inhaling with a spacer

Endnotes

For a history of spacers see Nikander, K. et al. The evolution of spacers and valved holding chambers. Journal of Aerosol Medicine and Pulmonary Drug Delivery, 2014.

(1) Hagmeyer L, et al. From the infant to the geriatric patient-Strategies for inhalation therapy in asthma and chronic obstructive pulmonary disease. The Clinical Respiratory Journal, 2023.

(2) Gillen M, et al. Effect of a spacer on total systemic and lung bioavailability in healthy volunteers and in vitro performance of the Symbicort® (budesonide/formoterol) pressurized metered dose inhaler. Pulmonary Pharmacology and Therapeutics, 2018.

(3) McIvor RA, et al. Optimizing the Delivery of Inhaled Medication for Respiratory Patients: The Role of Valved Holding Chambers. Canadian Respiratory Journal, 2018.

(4) Cunningham SJ and Crain EF. Reduction of morbidity in asthmatic children given a spacer device. Chest, 1994.

(5) Gillette C, et al. Inhaler Technique in Children With Asthma: A Systematic Review. Academic Pediatrics, 2016.

(6) Ming SWY, et al. Comparison of adverse events associated with different spacers used with non-extrafine beclometasone dipropionate for asthma. NPJ Primary Care Respiratory Medicine, 2019.

(7) Cotterell EM, et al. Child and parent satisfaction with the use of spacer devices in acute asthma. Journal of Paediatric Child Health, 2002.

(8) Chaney G, et al. A new asthma spacer device to improve compliance in children: a pilot study. Respirology, 2004.

(9) Tietz F, et al. Inhalation Devices in 7- to 15-Year-Old Children with Asthma - A Patient Preference Study. Patient Preference and Adherence, 2023.

(10) Payares-Salamanca L, et al. Metered-dose inhalers versus nebulization for the delivery of albuterol for acute exacerbations of wheezing or asthma in children: A systematic review with meta-analysis. Pediatric Pulmonology, 2020.

(11) Mahapatra A, et al. Comparison of effectiveness of metered-dose inhaler with spacer versus nebulizer in children (aged 5–14 years) with acute asthma exacerbation. Journal of Pediatric Critical Care, 2021.

(12) Doan Q, et al. Cost-effectiveness of metered-dose inhalers for asthma exacerbations in the pediatric emergency department. Pediatrics, 2011.

(13) Dhuper S, et al. Efficacy and cost comparisons of bronchodilator administration between metered dose inhalers with disposable spacers and nebulizers for acute asthma treatment. Journal of Emergency Medicine, 2011.

(14) Spin P, et al. A Cost Analysis of Salbutamol Administration by Metered-Dose Inhalers with Spacers versus Nebulization for Patients with Wheeze in the Pediatric Emergency Department: Evidence from Observational Data in Nova Scotia. Canadian Journal of Emergency Medicine, 2017.

(15) Rodriguez-Martinez CE, et al. Metered-dose inhalers vs nebulization for the delivery of albuterol in pediatric asthma exacerbations: A cost-effectiveness analysis in a middle-income country. Pediatric Pulmonology, 2020.

(16) Stolbrink M, et al. The availability, cost and affordability of essential medicines for asthma and COPD in low-income and middle-income countries: a systematic review. The Lancet Global Health, 2022.

(17) Mortimer K. et al. Asthma management in low and middle-income countries: case for change. The Lancet Respiratory Medicine, 2022.

(18) Poowuttikul P, et al. Poor Adherence With Medication Refill and Medical Supplies Maintenance as Risk Factors for Inpatient Asthma Admission in Children. Global Pediatric Health, 2017.

(19) Desalu OO, et al. Asthma in Nigeria: are the facilities and resources available to support internationally endorsed standards of care? Health Policy, 2011.

(20) Dhumal A, et al. Do medical and nursing students know the correct use of inhalers? Results of UPSIDE India study. European Respiratory Journal, 2018.

(21) Barne M. Gaps in asthma diagnosis and treatment in low- and middle-income countries. Frontiers in Allergy, 2023.

- (22) Osmond MH, et al, PERC Spacer Study Group. Barriers to metered-dose inhaler/spacer use in Canadian pediatric emergency departments: a national survey. *Academic Emergency Medicine*, 2007.
- (23) Scott SD, et al, Pediatric Emergency Research Canada (PERC) MDI/spacer Study Group. Barriers and supports to implementation of MDI/spacer use in nine Canadian pediatric emergency departments: a qualitative study. *Implementation Science*. 2009.
- (24) Volerman A, et al. Determinants of asthma knowledge and practices among caregivers of children with moderate-to-severe persistent asthma. *Annals of Allergy, Asthma, and Immunology*, 2021.
- (25) Topal E, et al. Effects of modifying visual inhaler spacer usage instructions on correct usage rate of untrained users. *International Forum of Allergy and Rhinology*, 2020.
- (26) Dierick BJH, et al. Electronic monitoring with a digital smart spacer to support personalized inhaler use education in patients with asthma: The randomized controlled OUTERSPACE trial. *Respiratory Medicine*, 2023.
- (27) Naidoo KL, et al. Barriers to childhood asthma care in sub-Saharan Africa: a multicountry qualitative study with children and their caregivers. *BMJ Open*, 2023.
- (28) Zar HJ, et al. Home-made spacers for bronchodilator therapy in children with acute asthma: A randomised trial. *Lancet*, 1999.
- (29) Schor D, et al. Home-made spacer as an auxiliary device in administration of beclomethasone via pressurized metered dose inhaler for asthma control. A randomized controlled pragmatic trial. *Respiratory Medicine*, 2017.
- (30) Sayed OA, et al. Assessment of Emergency Spacers Versus Traditional Spacers, An In-Vitro Model for Aerosol Delivery. *AAPS PharmSciTech*, 2025.
- (31) Saeed H, et al. Evaluation of a cardboard-based spacer for enhancing aerosol delivery from pressurized metered dose inhalers. *Journal of Asthma*, 2025.
- (32) Rodríguez-Martínez CE, et al. Commercial valved spacers versus home-made spacers for delivering bronchodilator therapy in pediatric acute asthma: a cost-effectiveness analysis. *Journal of Asthma*, 2021.