

MARCELLA NIEHOFF SCHOOL OF NURSING SCHOOL-BASED HEALTH CENTER

Adolescent Asthma Management: Implementing SMART Therapy in School- Based Health Centers

WEDNESDAY, JUNE 24, 2026: BUECHELE, RINCON



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Learning Objectives

1. Accurately identify adolescent patients appropriate for SMART therapy in alignment with clinical guidelines.
2. Demonstrate effective prescription and education of SMART therapy, including inhaler technique and monitoring strategies, within the school-based health center setting

Who We Are & Who We Serve

- **JACQUELINE RINCON, MSN, APRN, FNP-BC**
(ALMOST FINISHED WITH HER DNP!)
- **SUSAN BUECHELE, DNP, APRN, CPNP-PC, IBCLC**
- Interprofessional team
- Medical, Behavioral Health, Dietetics
- Services provided in English and Spanish
- Located in a Chicagoland suburban high school
 - 3 high schools in the district & feeder schools

2024-25 Illinois State Report Card:

- 32.8% of students at the HS and 27.6% in the district are English learners
- 52.9% of students in the HS and district were identified as low-income

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Acknowledgments

- Disclosures: None
- Images generated using Microsoft 365 Copilot (GPT-5)
- Presentation proofread by Grammarly



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Workshop Schedule

1. Review the Importance of Optimal Asthma Management in Adolescents
2. Definition and overview of SMART therapy for adolescents
3. Review of clinical guidelines for SMART therapy in the adolescent population
4. Discuss asthma assessment in clinical practice, tools, and inhalers
5. Review case studies and determine if they are candidates for SMART therapy
6. Discuss and practice writing out Asthma Action Plans for adolescents on SMART therapy
7. Discuss barriers to SMART therapy and potential solutions
8. Practice scenario with a partner

Adolescent Asthma & the Importance of Optimal Management

Prevalence & Burden

- One of the most common chronic conditions in adolescents characterized by chronic airway inflammation (CDC, 2024).
- Affects 10% of adolescent population worldwide (Asher et al., 2020)
- Children & Adolescents with asthma miss more days of school due to asthma than their peers (CDC 2021; CDC 2015)

Unique Aspects in Adolescents

- Adolescence is a period of change that can complicate asthma management and adherence to treatment (Bender, 2016)
- Consider the stage of development in adolescence

Consequences of Poorly Controlled Asthma

- Increases the risk of severe exacerbations, hospitalizations, and long-term lung function decline (GINA, 2025; NHLBI, 2020)
- Increased absenteeism (Moonie, Sterling, Figgs, & Castro, 2006)
- Adolescents with uncontrolled asthma are more likely to miss sports and physical activities, resulting in negative physical, emotional, and social consequences (Mazurek & Syamlal, 2020; Papachristou et al., 2021; de Freitas et al., 2022; GINA, 2023).

Benefits of Optimal Management

- Guideline-based management improves symptom control, reduces exacerbations, and enhances quality of life (GINA, 2025; NHLBI, 2020).
- Involving adolescents in self-management education leads to better adherence and outcomes (Bender, 2016)

What is **SMART** therapy?

- **S**ingle
- **M**aintenance
- **A**nd
- **R**eliever
- **T**herapy

Also referred to as MART



Illustrative image of inhaler use.

Note. Image generated using Microsoft 365 Copilot (GPT-5), 2026. Image is AI-generated and depicts a simulated individual.

- History of asthma management guidelines & maintenance therapy
- Newer rapid acting LABAs (Formoterol)



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Max Dosing for SMART Therapy in Adolescents

Budesonide/Fomoterol (Symbicort) 80/4.5 or 160/4.5

Maximum Daily Dose:

- Ages 12 and up do not exceed a total of 12 puffs in a 24-hour period including both maintenance and reliever use.

Example:

- If prescribed 2 puffs twice daily (4 puffs total as maintenance), up to 8 additional puffs may be used as needed for symptoms within a 24-hour period, not exceeding 12 total puffs.

Benefits of SMART Therapy & Evidence Supporting SMART Use in Adolescents

- **Global Initiative for Asthma Guidelines** are internationally recognized and synthesized from high-quality RCTs (GINA, 2023)
- **National Heart, Lung, and Blood Institute 2020 guidelines** recommend SMART therapy (NIH, 2020)
- **National Asthma Council Australia** recommends SMART therapy (National Asthma Council Australia, 2022)
- An as-needed budesonide-formoterol reduces risk of severe exacerbation compared to as-needed albuterol (Beasley et al, 2019)
- Budesonide-formoterol as needed was superior to SABA in reducing asthma exacerbations in Mild Asthma (O'Byrne et al., 2018)
- In patients who were corticosteroid free, adding budesonide reduced the rate of severe exacerbations and poorly controlled asthma days by more than half (O'Byrne et al., 2001)
- SMART prolonged the time to first exacerbation vs fixed dose budesonide and rates of exacerbation requiring medical intervention reduced to SMART (Bisgaard et al., 2006)
- Combination of budesonide and formoterol on demand improves asthma control by reducing exercise-induced bronchospasm, the same as regular budesonide, despite a lower steroid dose (Lazarinis et al., 2013)

Clinical Guideline Principals

2026 GLOBAL INITIATIVE FOR ASTHMA (GINA) GUIDELINES

Recommendation:

As-needed low-dose ICS–formoterol as the preferred reliever for adolescents, and the use of maintenance and reliever therapy with ICS–formoterol (SMART) for improved asthma control and reduced exacerbations.

2026 GINA updates – Tiers for treatment options but ICS-Formoterol, the single maintenance and reliever inhaler, is still the tier 1, preferred approach.

2020 GUIDELINE UPDATES - NATIONAL ASTHMA EDUCATION AND PREVENTION PROGRAM (NAEPP)

Recommendation:

The use of Single Maintenance and Reliever Therapy (SMART) with an inhaled corticosteroid (ICS)–formoterol combination for individuals aged 4 years and older with moderate to severe persistent asthma. Specifically, in Step 3 and higher, SMART is recommended as both daily maintenance and as-needed (reliever) therapy.

Criteria & Considerations for Appropriate Candidate Selection

Diagnosis confirmed by history, examination, and/or spirometry

Assess & Categorize Asthma Severity

- Evaluate baseline severity as mild, moderate, or severe based on symptoms, exacerbation history, and lung function.
 - Mild asthma: well controlled with low intensity treatment (as needed low-dose ICS-Formoterol or low dose ICS plus as needed SABA)-GINA recommends avoiding use of this term
 - Moderate asthma: asthma that is well controlled with low-dose ICS formoterol or low-dose ICS plus as needed SABA
 - Severe asthma: uncontrolled despite treatment with high-dose ICS-LABA or that require high-dose ICS-LABA to prevent it from becoming uncontrolled
 - Limitations*

Criteria & Considerations for Appropriate Candidate Selection (Continued)

Assess & Categorize Asthma Control

- ***Well-Controlled:*** Minimal symptoms, infrequent SABA use, no activity limitation, normal lung function.
- ***Partly Controlled:*** More frequent symptoms or reliever use, some activity limitation, reduced lung function.
- ***Uncontrolled:*** Frequent symptoms, frequent reliever use, significant activity limitation, poor lung function, or recent exacerbations.

Asthma Assessment Tools & Inhaler Techniques

Asthma Control Test (ACT)

- Validated
- Patient-completed questionnaire
- Assesses asthma control in individuals aged 12 years and older
- Consists of five questions that evaluate symptoms, use of rescue medications, and the impact of asthma on daily functioning over the past four weeks.
- Each item is rated on a 5-point scale, and total scores range from 5 (poor control) to 25 (complete control), with higher scores indicating better asthma control. The ACT helps clinicians monitor asthma management and determine the need for adjustments in therapy.
- Barriers to the ACT with SMART therapy

Criteria & Considerations for Appropriate Candidate Selection (Continued)

Prior Treatment Response

- Inadequate control on standard inhaled corticosteroid (ICS) and short-acting beta-agonist (SABA) regimen.
- Demonstrated need for both daily controller and as-needed relief.

Adherence and Inhaler Technique

- Demonstrated ability and willingness to adhere to prescribed inhaler regimens.
- Proper inhaler technique confirmed.

Education and Understanding

- Patient and family/caregivers understand and accept the principles of SMART therapy (Single Maintenance and Reliever Therapy).
- Sufficient maturity for adolescent self-management or supervised use with caregiver support.

Adolescents (& Adults) Track 1: Preferred

GINA Track 1

- Steps 1-2
 - Anti-inflammatory Reliever (AIR)-only: as needed low dose ICS-Formoterol
- Step 3
 - Maintenance and reliever therapy with low dose ICS-Formoterol (MART)
- Step 4-5
 - Refer out

RELIEVER for all steps: As-needed low dose ICS-Formoterol

GINA TRACK 1 example with
budesonide-formoterol 160/4.5 mcg
or BDP-formoterol 100/6 mcg,
by DPI or pMDI

STEPS 1 – 2

Take 1 inhalation as needed
(AIR-only*)

STEP 3

Take 1 inhalation morning
and evening, and 1 inhalation
as needed (Step 3 MART*)

STEP 4

Take 2 inhalations morning
and evening, and 1 inhalation
as needed (Step 4 MART*)

STEP 5

Refer for expert
assessment,
phenotyping,
and add-on
treatment for
severe asthma

See Box 4-8 for other formulations.

GINA TRACK 1: the **PREFERRED** treatment for adults and adolescents.

Using low dose ICS-formoterol as an anti-inflammatory reliever (AIR*), with or without maintenance ICS-formoterol, reduces the risk of exacerbations compared with using a SABA reliever, and is a simple regimen, with a single medication, device and dose across treatment steps.

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Examples of Track 1

(GINA, 2026)

Step 1-2: budesonide-formoterol 160/4.5mcg

- Take 1 inhalation as needed

Step 3: budesonide-formoterol 160/4.5mcg

- Take 1 inhalation in the morning and 1 inhalation in evening, and 1 inhalation as needed

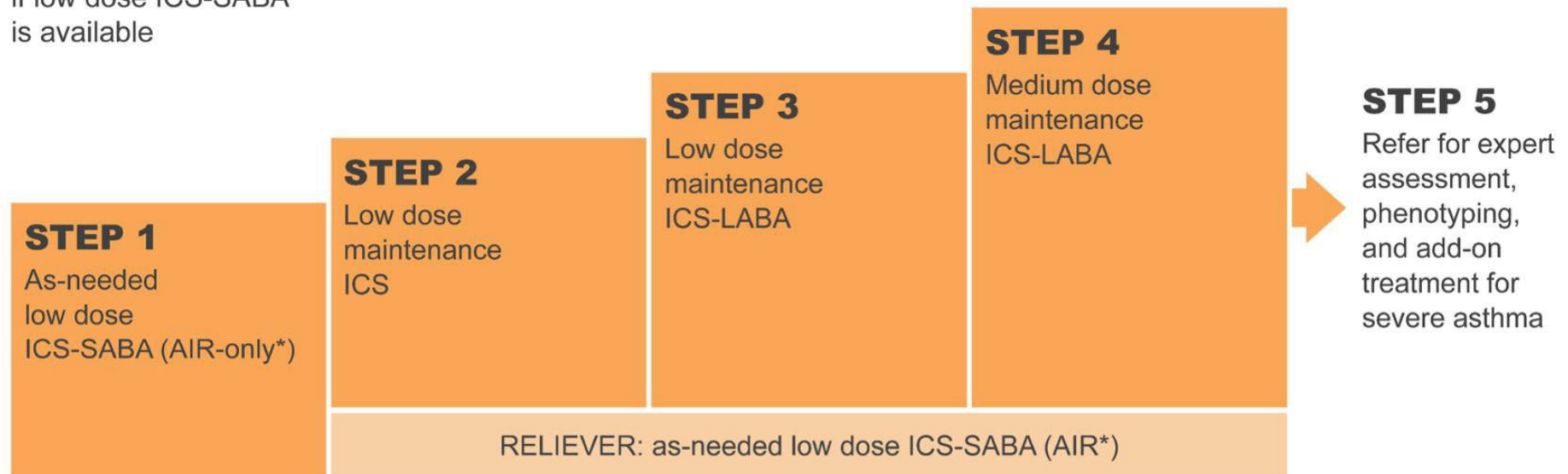
Adolescents (& Adults) Track 2: Alternative

GINA Track 2

- Steps 1
 - AIR-only: as needed low dose ICS-Formoterol (combination or separate inhalers)
- Step 2
 - Low dose maintenance ICS
- Step 3
 - Low dose maintenance ICS-LABA
- Step 4-5
 - Refer out

RELIEVER for all steps: As-needed low dose ICS-Formoterol

GINA TRACK 2 example
if low dose ICS-SABA*
is available

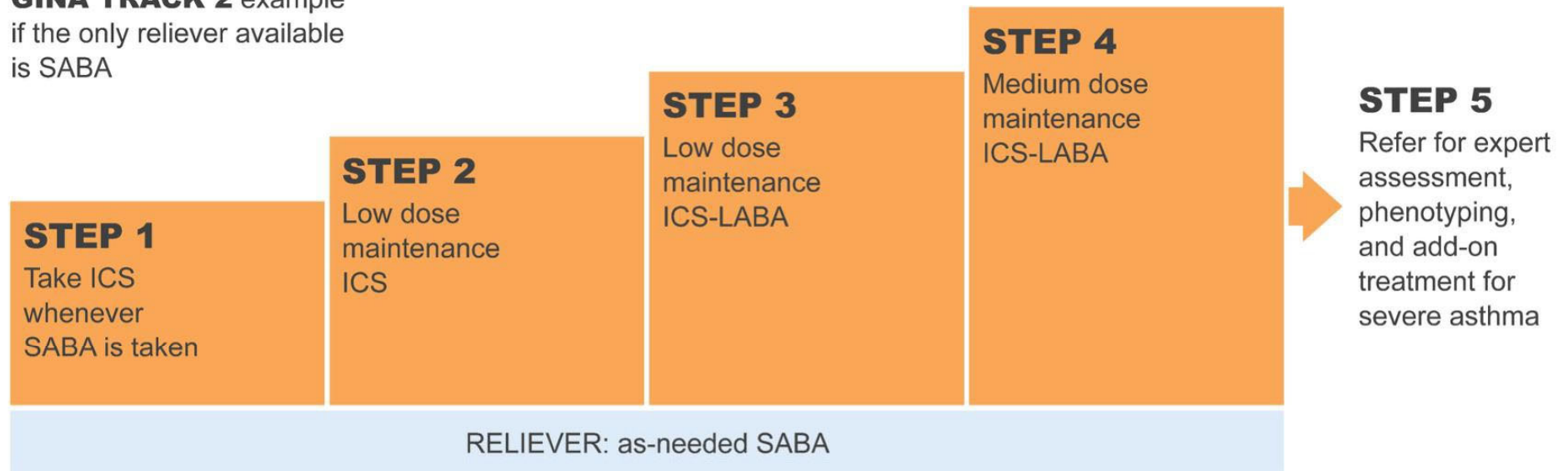


GINA TRACK 2: Alternative **CONTROLLER and **RELIEVER** for adults and adolescents, if combination ICS-SABA is available.**

In Steps 2–4, ensure patient understands the difference between their controller and reliever inhalers. If controller and reliever are in different types of inhaler device, or if changing steps requires a change in device, train patient in the correct inhaler technique.

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GINA TRACK 2 example
if the only reliever available
is SABA

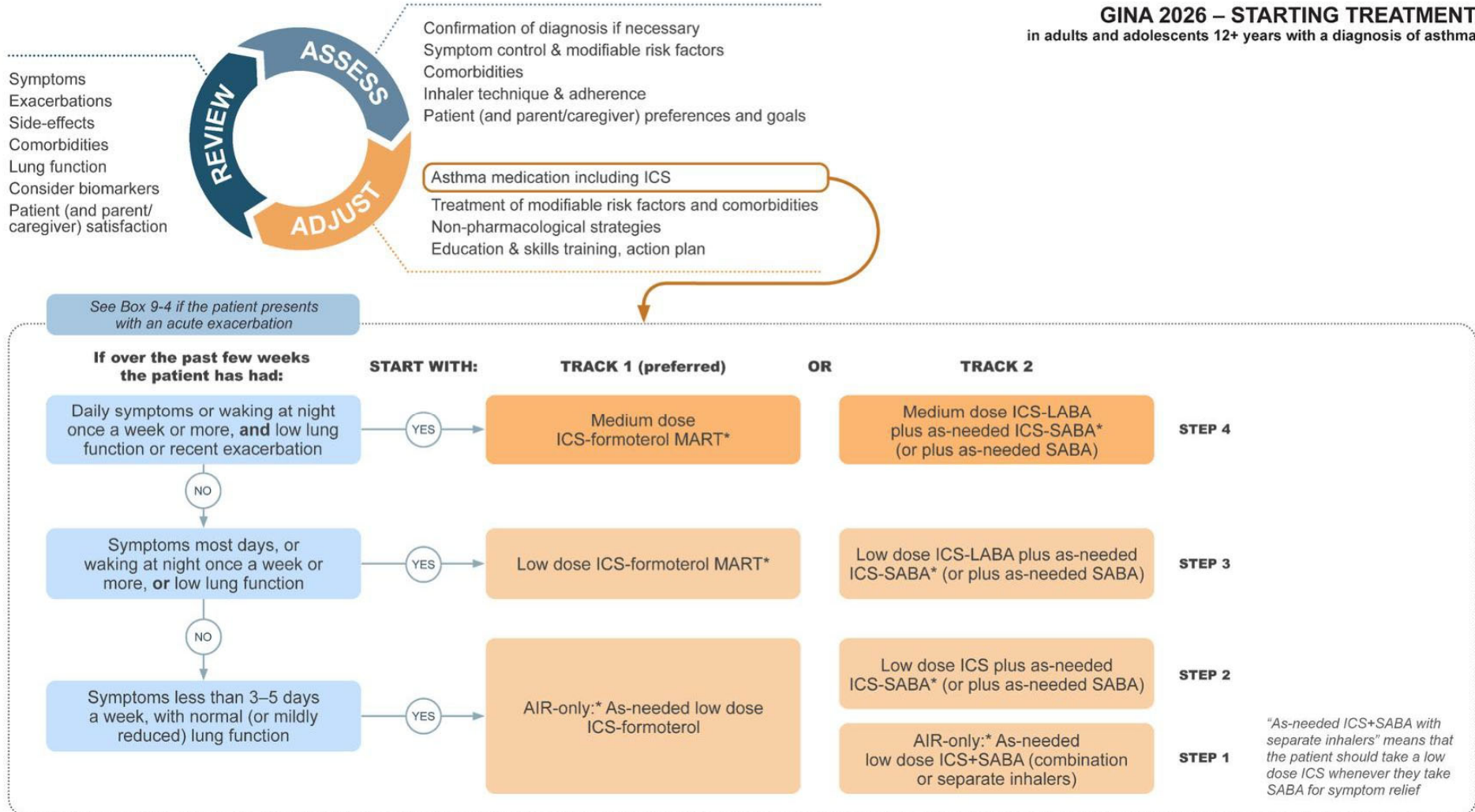


GINA TRACK 2: Alternative **CONTROLLER and **RELIEVER** for adults and adolescents, if the only reliever available is SABA.**

Before considering a regimen with SABA reliever, check if the patient is likely to adhere to daily ICS treatment. If controller and reliever are in different types of inhaler device, or if changing steps requires a change in device, train patient in the correct inhaler technique.

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GINA 2026 – STARTING TREATMENT in adults and adolescents 12+ years with a diagnosis of asthma



CASE STUDY REVIEW

- Small group review of 2 case studies
- Identify SMART therapy candidates and explain decisions
- Group discussion and share-out/debrief with the larger group

Prescribing & Education Practices

- Steps for prescribing SMART in school-based settings
- Writing Asthma Action Plans for SMART therapy
- Teach-back: Practice explaining SMART, demonstrating inhaler use, and outlining monitoring strategies
- Possible Side Effect



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Barriers & Solutions

- Barriers to SMART implementation
- **What have you experienced?**
 - Medication access
 - Cost/insurance coverage
 - Pharmacy
 - Student and parental buy-in
 - Adherence
 - School staff, administration, coaches unfamiliar with SMART therapy
- Group discussion of solutions, with resource sharing
 - Example: Patients can typically refill a Symbicort inhaler every 25 days.

ROLE PLAY SCENARIO PRACTICE

- Pair up with another person
- Choose if you would like to be the patient or the health care provider
- You have 10 minutes for the scenario, and then we are going to come back together as a large group for a discussion.



Figure 2. Health care professionals engaging in role-playing for training purposes.

References

- Arora, N. S., Zhou, S., & Baptist, A. P. (2024). Regulatory and insurance challenges must be overcome in the United States to meet global standards for asthma management. *Journal of Allergy and Clinical Immunology: In Practice*, 12(3), 624–626. <https://doi.org/10.1016/j.jaip.2023.11.034>
- Asher, M. I., Garcia-Marcos, L., Pearce, N. E., & Strachan, D. P. (2020). Trends in worldwide asthma prevalence. *European Respiratory Journal*, 56(6), 2002094. <https://doi.org/10.1183/13993003.02094-2020>
- Bender, B. G. (2016). Clinical implications of nonadherence in asthma. *Current Opinion in Pulmonary Medicine*, 22(1), 59–64. <https://doi.org/10.1097/MCP.0000000000000238>
- Bisgaard, H., Le Roux, P., Bj  mer, D., Dymek, A., Vermeulen, J. H., & Hultquist, C. (2006). Budesonide/formoterol maintenance plus reliever therapy: A new strategy in pediatric asthma. *Chest*, 130(6), 1733–1743. <https://doi.org/10.1378/chest.130.6.1733>
- Centers for Disease Control and Prevention. (2024). Asthma data, statistics, and surveillance. <https://www.cdc.gov/asthma/asthmadata.htm>
- Centers for Disease Control and Prevention. (2015). Asthma-related missed school days among children aged 5–17 years. *Morbidity and Mortality Weekly Report*, 64(13), 362. <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6413a5.htm>
- Centers for Disease Control and Prevention. (2021). *Asthma and school absenteeism among children aged 5–17 years: United States, 2020*. https://www.cdc.gov/asthma/asthma_stats/absenteeism.htm
- Cloutier, M. M., Baptist, A. P., Blake, K. V., Brooks, E. G., Bryant-Stephens, T., DiMango, E., Dong, S., Fuhlbrigge, A. L., Gergen, P. J., Granados, A., Hall, C. B., Hartert, T. V., Kelly, H. W., Kitt, D. N., Lugogo, N. L., Matsui, E. C., Okelo, S. O., Pongracic, J. A., Portnoy, J. M., ... Wilkerson, M. L. (2020). 2020 focused updates to the asthma management guidelines: A report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group. *Journal of Allergy and Clinical Immunology*, 146(6), 1217–1270. <https://doi.org/10.1016/j.jaci.2020.10.003>
- de Freitas, S. L., de Oliveira, C. M., da Silva, M. R., & da Silva, L. M. (2022). Asthma's impact on activity limitation among adolescents: A population-based study. *BMC Pulmonary Medicine*, 22, 191. <https://doi.org/10.1186/s12890-022-01927-3>

References

- Fitzpatrick, A. M., Gillespie, S. E., Mauger, D. T., Sorkness, C. A., Szeffler, S. J., Hartert, T.V., ... & Teague, W. G. (2019). Racial disparities in asthma-related health care use in the National Heart, Lung, and Blood Institute's Severe Asthma Research Program. *Journal of Allergy and Clinical Immunology*, 143(6), 2052–2061. <https://doi.org/10.1016/j.jaci.2019.01.031>
- Global Initiative for Asthma. (2024). Global strategy for asthma management and prevention (2024 update). <https://ginasthma.org/2024-report/>
- Grammarly Inc. (2026). Grammarly (Version 2026) [AI writing assistant]. <https://www.grammarly.com/>
- Illinois State Board of Education. (2025). 2024–2025 Illinois report card: Proviso Township HSD 209. <https://www.illinoisreportcard.com/District.aspx?districtid=13040090017>
- Lazarinis, N., Jørgensen, L., Ekström, T., Bjermer, L., Dahlén, B., Pullerits, T., Hedlin, G., Carlsen, K. H., & Larsson, K. (2014). Combination of budesonide/formoterol on demand improves asthma control by reducing exercise-induced bronchoconstriction. *Thorax*, 69(2), 130–136. <https://doi.org/10.1136/thoraxjnl-2013-203557>
- Mazurek, J. M., & Syamlal, G. (2020). Physical activity in adults and children with asthma—United States, 2011–2017. *Journal of Asthma*, 57(7), 742–751. <https://doi.org/10.1080/02770903.2019.1590590>
- Meghji, J., Mortimer, K., Agustí, A., Allwood, B. W., Asher, I., Bateman, E. D., Bissell, K., Bolton, C. E., Bush, A., Celli, B., Chiang, C. Y., Cruz, A. A., Dinh-Xuan, A. T., El Sony, A., Fong, K. M., Fujiwara, P. I., Gaga, M., Garcia-Marcos, L., Halpin, D. M. G., Hurst, J. R., ... Marks, G. B. (2021). Improving lung health in low-income and middle-income countries: from challenges to solutions. *Lancet (London, England)*, 397(10277), 928–940. [https://doi.org/10.1016/S0140-6736\(21\)00458-X](https://doi.org/10.1016/S0140-6736(21)00458-X)
- Microsoft Corporation. (2026). Microsoft 365 Copilot (Version GPT-5) [AI image generation tool]. <https://www.microsoft.com/en-us/microsoft-365/copilot>
- Moonie, S., Sterling, D. A., Figgs, L. W., & Castro, M. (2006). Asthma status and severity affects missed school days. *Journal of School Health*, 76(1), 18–24. <https://doi.org/10.1111/j.1746-1561.2006.00060.x>
- Nathan, R. A., Sorkness, C. A., Kosinski, M., Schatz, M., Li, J. T., Marcus, P., Murray, J. J., Pendergraft, T.B., & Zimmerman, B. (2004). Development of the asthma control test: A survey for assessing asthma control. *Journal of Allergy and Clinical Immunology*, 113(1), 59–65. <https://doi.org/10.1016/j.jaci.2003.09.008>
- O'Byrne, P. M., Barnes, P. J., Rodriguez-Roisin, R., Runnerstrom, E., Sandstrom, T., Svensson, K., & Tattersfield, A. (2001). Low dose inhaled budesonide and formoterol in mild persistent asthma: the OPTIMA randomized trial. *American journal of respiratory and critical care medicine*, 164(8 Pt 1), 1392–1397. <https://doi.org/10.1164/ajrccm.164.8.2104102>

References

- Papachristou, E., Koutsonikou, T., Karademas, E. C., & Koutantji, M. (2021). Psychosocial impact of asthma on children and adolescents: A systematic review. *Pediatric Pulmonology*, 56(7), 2366–2381. <https://doi.org/10.1002/ppul.25429>
- Reddel, H. K., Bateman, E. D., Schatz, M., Krishnan, J. A., & Cloutier, M. M. (2022). A practical guide to implementing SMART in asthma management. *Journal of Allergy and Clinical Immunology: In Practice*, 10(1). <https://doi.org/10.1016/j.jaip.2021.09.034>
- Reddel, H. K., FitzGerald, J. M., Bateman, E. D., Bacharier, L. B., Becker, A., Brusselle, G., Buhl, R., Cruz, A. A., Fleming, L., Inoue, H., Ko, F. W., Krishnan, J. A., Levy, M. L., Lin, J., Pedersen, S. E., Sheikh, A., Yorgancioglu, A., & Boulet, L. P. (2019). GINA 2019: A fundamental change in asthma management: Treatment of asthma with short-acting bronchodilators alone is no longer recommended for adults and adolescents. *European Respiratory Journal*, 53(6), 1901046. <https://doi.org/10.1183/13993003.01046-2019>
- Van de Graaf, M., Joseph, L., Patel, S. J., & Kaviany, P. (2025). Descriptive analysis of access to SMART among a population of Medicaid-insured pediatric patients. *Hospital Pediatrics*, 15(5), e212–e214. <https://doi.org/10.1542/hpeds.2024-008085>
- Zahrn, H. S., Bailey, C. M., Qin, X., & Moorman, J. E. (2021). Assessing asthma control and associated risk factors among persons with current asthma—Findings from the child and adult Asthma Call-back Survey. *The Journal of Asthma*, 58(5), 636–646. <https://doi.org/10.1080/02770903.2020.1748241>

