Working together to improve health care quality, outcomes, affordability, and equity in Washington State

Pediatric Asthma

January 2023

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Executive Summary

Asthma is the most common chronic disease among children,[1] with many potential risk factors including smoking, obesity, family history, and environmental triggers, and adverse childhood experiences.[2] From 2008 to 2013 the estimated annual economic cost of asthma was $81.9 billion due to medical costs, loss of work and school days, and asthma-related mortality.[3] In Washington state nearly 120,000 children have been diagnosed with asthma, accounting for between 8 to 11 percent of children in middle and high school.[4] Additionally, the burden of asthma in the United States falls disproportionately on Black, Hispanic, and American Indian/Alaskan Native people.[5] Asthma cannot be cured but can be effectively managed through guidelines-based treatment and mitigation plans.

The Bree Collaborative elected to develop recommendations for pediatric asthma in 2022 and convened a workgroup of subject matter experts from January 2022 to January 2023. Pediatric asthma control requires collaboration across numerous partners ranging from pediatricians to school nurses. In response, the Bree Collaborative's pediatric asthma workgroup includes providers, plans, public health agencies, patient advocates, and school representatives. This guideline is meant to address asthma triggers and control across numerous sites and ensure communication across sectors.

Recommendations focus on asthma control in the **clinical setting, home setting, school setting, environmental exposures,** and **funding**. Additionally, recommendations are directed toward:

- Health delivery systems
- Clinicians
- Home-based interventions and community health workers
- Schools and school nurses
- Payers and purchasers
- Public health agencies
- Those receiving care (patients/consumers)

We summarize potential avenues to improve alignment for pediatric asthma care through a review of published evidence, best practices from existing interventions, and subject matter expert collaboration across health, public, and social sectors.

We recommend readers scroll to the section most relevant to their organization to find recommendations for their setting. We hope this guideline increases collaboration across programs where children with asthma receive care and improves effective asthma management for all children in Washington state.

Bree Collaborative Background

Washington State House Bill 1311 established the Dr. Robert Bree Collaborative in 2011 *"…to provide a mechanism through which public and private health care stakeholders can work together to improve quality, health outcomes, and cost effectiveness of care in Washington State."* The Bree Collaborative was named in memory of Dr. Robert Bree, a leader in the imaging field and a key member of previous health care quality improvement collaborative projects.

Members are appointed by the Washington State Governor and include public health care purchasers for Washington State, private health care purchasers (employers and union trusts), health plans, physicians and other health care providers, hospitals, and quality improvement organizations. The Bree Collaborative is charged with identifying health care services annually with substantial variation in practice patterns, high utilization trends in Washington State, or patient safety issues. For each health care service, the Bree Collaborative identifies and recommends best-practice, evidence-based approaches that build upon existing efforts and quality improvement activities to decrease variation. In the bill, the legislature does not authorize agreements among competing health care providers or health carriers as to the price or specific level of reimbursement for health care services. Furthermore, it is not the intent of the legislature to mandate payment or coverage decisions by private health care purchasers or carriers.

See **Appendix A** for a list of current Bree Collaborative members.

Recommendations are sent to the Washington State Health Care Authority for review and approval. The Health Care Authority (HCA) oversees Washington State's largest health care purchasers, Medicaid, and the Public Employees Benefits Board Program, as well as other programs. The HCA uses the recommendations to guide state purchasing for these programs. The Bree Collaborative also strives to develop recommendations to improve patient health, health care service quality, and the affordability of health care for the private sector but does not have the authority to mandate implementation of recommendations.

For more information about the Bree Collaborative, please visit: www.breecollaborative.org.

Bree Collaborative members identified pediatric asthma as a priority improvement area and convened a workgroup to develop evidence-informed standards. The workgroup met from January to November 2022.

See **Appendix B** for the workgroup charter and a list of members.

Background

Asthma is a long-term disease that causes inflammation and swelling of the airways. Often, people with asthma are sensitive to "triggers" that may not bother other people, which can include dust mites, pollen, molds, cigarette smoke, or air pollution.[6] About 1 in 12, or 6 million children in the US ages 0 – 17 have asthma,[7] the highest asthma prevalence rate of any other age group in 2018.[8] Additionally, it is estimated that 50% of children with asthma have uncontrolled[1] asthma.[9] In the United States, the burden of asthma falls disproportionately on Black, Hispanic, and America Indian and Alaskan native populations with disparities present in asthma prevalence, mortality, and health care utilization.[10] The estimated annual economic burden of asthma in the United States is $81.9 billion.[11]

Washington state has been identified as having one of the highest asthma prevalence in the nation, with more than half a million adults and nearly 120,000 youth currently diagnosed with asthma.[12] Over one year in Washington state, 28% of youth with asthma lacked routine healthcare visits, and one in five youth with asthma visited an emergency room to manage asthma symptoms.[13] Additionally, poor control of pediatric asthma can lead to chronic absenteeism and affect the academic success of children.[14]

While we have limited understanding of what causes asthma, we can prevent asthma attacks or at least make them less severe.[15] Effectively managing pediatric asthma will require collaboration across multiple stakeholders who care for children, including pediatricians, school nurses, and public health agencies.

Given the multidisciplinary nature of pediatric asthma control, this guideline focuses on strategies to align efforts across key stakeholders. Recommendations are meant to supplement existing treatment guidelines from the National Asthma Education and Prevention Program,[16] best practices for community interventions from the CDC's Community Preventative Services Task Force,[17] and expectations for pediatric asthma care in schools from Washington State's Asthma Management in Educational Settings guide.[18] Additionally, this guideline builds off previous work to mitigate the effects of climate on asthma from the Asthma and Allergy Foundation of America[19] and offers strategies for funding pediatric asthma interventions drawing from previous research on funding mechanisms from the Brookings Center for Health Policy.[20] The Bree workgroup's focus areas are detailed in **Table 1.**

[1] This guideline uses the terms "controlled" and "uncontrolled" asthma as defined by the NHLBI Asthma Guidelines. Varying levels of asthma "control" are intended as clinical terms to help direct resources as needed.

Table 1: Bree Collaborative Pediatric Asthma Focus Areas

Focus Areas	Goal(s)
Clinical Setting	• Appropriately establish asthma diagnosis and assess for severity and risk. • Develop an asthma management plan to effectively control asthma. • Implement appropriate asthma metrics to ensure quality care.
Home Setting	• Ensure access to home-based interventions for children who need indoor environmental management to achieve control. • Offer recommendations to manage asthma home-based interventions. • Recommend potential sources of sustainable funding for home-based interventions.
School Setting	• Appropriately manage pediatric asthma in the school setting. • Improve communication between school nurses, school-based health centers, and pediatricians/clinical providers.
Environmental Exposure	• Mitigate the effects of climate change, air pollution, and other environmental triggers on pediatric asthma. • Develop strategies to respond to environmental triggers in the built environment.
Funding	• Consider alternative funding models for pediatric asthma that prioritize prevention and control and to decrease the use of high-cost emergency or hospital admissions for asthma.

Recommendations

Recommendations for Health Delivery Systems

Clinical Setting

- Ensure asthma management policies and procedures follow the most recent NHLBI guidelines.
    a. Promote the use of spirometry in primary care clinics and train clinicians in how to use spirometry as an evidence-based tool for diagnosing and managing asthma.
    b. Promote education and distribution of spacers for all patients with meter-dose inhalers. Patients may need more than one spacer to keep at multiple sites like home and school.
- Develop a population health strategy for managing pediatric asthma that includes automated event notification, care coordination, and a registry of pediatric asthma patients.
    a. Implement automated event notification systems for patients diagnosed with asthma when admitted to the emergency room, urgent care, or inpatient hospitalization.
    b. Implement clinic-based care coordination for pediatric asthma patients' clinical needs.
        i. Ensure alignment and communication across care coordination provided in other settings.
- Develop metrics for asthma control quality.
    a. Track and measure asthma prevalence and stratify by severity and control.
        i. Track severity and control using ICD-10 codes.
    b. Measure the Asthma Medication Ratio to track population health or alternatively measure the frequency of bronchodilator prescription refills.
    c. Measure rates of annual flu shot administration among children with asthma.

Home Environment:

- Pediatric patients admitted to the hospital for poorly controlled asthma should be referred for a home-based assessment and intervention where available.
    - See recommendations for public health agencies for more information about effective home-based interventions for asthma management.
- Consider implementing social needs screening and interventions in the clinical setting (Bree recommendations)

Climate/Environment

- Review Climate Action Handbook for Hospitals and consider making policy changes.
- Aim for carbon neutrality by reducing carbon emissions through renewable energy, greener care delivery, and low- and zero-emission transportation.
- Plan for climate mitigation infrastructure including adequate air filtration. Monitor clinical air quality.
- Enforce smoke-free policies
- Discuss air pollution mitigation when educating patient and family members about asthma management.
- Use environmentally friendly, EPA-approved disinfectants for cleaning

Funding

- Participate in alternative payment models that incentivize high-quality asthma care, especially risk-adjusted primary care capitation models.

Recommendations for Clinicians

Clinical Setting

- Appropriately establish an accurate asthma diagnosis according to NHLBI Guidelines.
    - Determine that signs and symptoms of recurrent reversible airway obstruction are present based on history and exam. Consider other causes of obstruction.
        - For children over 5 years old: In addition to patient history, use spirometry to determine lung function. Rule out other potential conditions that can cause asthma-like symptoms such as respiratory tract infections.
        - In absence of other diagnostic tests (spirometry), determine if symptoms respond to albuterol.
        - For children under 5 years old: rely on information from the patient and caregiver. Diagnostic tests are not accurate for children under 5.
    - If the asthma appears to be triggered by environmental allergies, recommend allergy skin testing or blood testing for allergies.
    - Consider referral to a specialist (pediatric pulmonologist, allergist, asthma specialist) if diagnosis or testing is unclear.
- Assess for asthma severity (impairment and risk) and control according to most recent NHLBI guidelines.
    - Assess for severity at initial visit and reassess severity at least annually. Include assessment for comorbid conditions and/or environmental exposures.
    - Assess for control at all planned asthma visits, at least annually. Include assessment of proper medication administration technique, suitability of asthma action plan, patient adherence, and patient/caregiver concerns.
- Develop an asthma management plan that includes education, trigger mitigation, and medication management.
    - Educate patients and caregivers on self-management and trigger reduction.
    - Implement mitigation interventions for asthma triggers related to indoor allergens (e.g. dust mites), outdoor allergens (e.g. pollen), and/or irritants (e.g. smoke).
    - Promote smoking cessation and offer interventions to reduce exposure to second-hand smoke from tobacco, vape products, and cannabis.
    - Implement a medication plan for asthma management.
        - Initiate corticosteroid and rescue treatment as appropriate. Consider dry powder inhalers (DPIs) for older children and teens who can tolerate DPIs.
        - Follow the 2020 updates to NHLB guidelines for treatment using inhaled corticosteroids (ICS) and short-acting beta$_2$-agonists (SABA)
    - Offer spacers to patients with meter-dose inhalers. Open a guided dialogue with parents and caregivers about the patient's spacer needs for settings including daycare, schools, multiple parent's houses, or more. Educate patients and caregivers about the use and cleaning of spacers.
    - Refer to a specialist to provide immunotherapy if required.

        - For individuals ages 5 years and older with mild to moderate allergic asthma, recommend use of subcutaneous immunotherapy as an adjunct treatment to standard pharmacotherapy.
        - For individuals with persistent allergic asthma, recommend against the use of sublingual immunotherapy.
- Schedule planned preventative visits for asthma control at least annually.
    - Ensure the asthma management plan reduces impairment and risk. Implement the Asthma Control Test to determine the patient's level of asthma control at every visit.
    - Schedule additional planned preventative visits specific to asthma control as needed. Review and update the asthma control plan as needed. Normalize routine asthma control visits.
    - Routine asthma control visits should also include multifaceted approaches to patient education, control of environmental triggers, and/or comorbid conditions that affect asthma.
    - Telehealth visits may be appropriate for follow-up and asthma education.

<u>Home and School Setting Coordination:</u>

- Communicate asthma management plan with external partners and the broader care team including school nurses and community health workers.
- Establish clear lines of communication with the patient's school nurse. Ask the parent/caregivers to complete a release of information form to allow bi-directional communication about the asthma plan.
    - Send printed discharge instructions or other forms from the child's asthma control visits to the school nurse
    - Ask parents/caregivers to fill out release forms while at their asthma control visit
    - Work to standardize delivery system liability waivers to facilitate information sharing.
- Align educational efforts about inhaler use and asthma management with the school-based asthma care plan.
- Provide asthma patients with a prescription for an inhaler and a spacer, as well as a second inhaler and spacer for school use.

Recommendations for Home-Based Interventions and Community Health Workers

<u>Home Setting/Care Coordination</u>

- Home-based multi-trigger, multicomponent interventions can reduce exposure to many indoor asthma triggers, including allergens and irritants. These interventions should include home visits by trained personnel to:
    - Provide asthma self-management education on environmental triggers.
    - Assess the home environment for asthma triggers using trained personnel.
    - Provide environmental management supplies (e.g., HEPA vacuums, green/non-toxic cleaners, impermeable mattress covers, portable air filtration devices and air filters).
    - Refer and provide access to home modification services (e.g., mold removal, furnace replacement), where necessary (and available) to bring asthma under control.
    - Encourage smoke-free environments. Promote smoking cessation to reduce exposure to second-hand smoke from tobacco, vape products, and cannabis.

- Programs may also offer non-environmental activities:
    - Motivational interviewing and goal setting to improve asthma self-management.
    - General asthma education on self-care including medication adherence, inhaler technique, symptom management, and trigger assessment/reduction
    - Social services and support, including coordinated care for the asthma client such as referrals to resources and legal/housing assistance.
        - Home-based interventions should consider implementing social need screening tools based on previous Bree recommendations.
    - Combine asthma-related interventions with other health interventions, such as teaching lead-poisoning prevention and offering vaccinations.
- Home-based interventions should:
    - Target services toward patients with not well or poorly controlled asthma. Conduct risk stratification to identify candidates for home-based interventions.
    - Consider behavioral and social drivers of asthma disparities.
    - Be tailored to diverse populations and programs, with expanded outreach for patients and families experiencing asthma disparities.
    - Include follow-up with multiple visits (at least 3) to build relationships with patients and caregivers. Interventions should include a face-to-face component for visits, whether in-person or through virtual means.
    - Hire and train community health workers to improve outreach.
        - Follow the NCQA/Penn Medicine guidelines for supporting community health workers.

Clinical Setting and School Setting Coordination

- Care coordination (whether home-based interventions, community-based organizations, or public health programs) should coordinate activities across care teams, including primary care providers, health plans, schools/child care, and other service providers.
    - Ensure information can be shared across programs. Fill out a release of information as needed.
    - Coordinate with community-based and government social and health programs.
    - Coordinate with health plans for connections to benefits and inform their care managers of the home-based care plans.
    - Participate in care coordination, such as closed loop referral systems.

Recommendations for Schools and School Nurses

School Setting

- Work to identify students with asthma
    - Monitor students for signs of asthma, including students with unusually high absence rates and multiple office visits for airway obstruction.
    - Solicit asthma plan forms from providers and include checkboxes for severity and control.
- Develop a care plan for all students with asthma and update the care plan at least annually.
    - Screen students for asthma control using the Asthma Control Test and refer to their primary care provider if asthma is not controlled.

  - Include education on proper inhaler technique and medication management as part of the care plan.
  - Refer to existing resources for managing asthma in the school environment, including the OSPI Asthma Management in education Settings (AMES) guideline, the AASA Addressing Childhood Asthma recommendations, and the CDC Strategies for Assessing Asthma in Schools.
- Communicate the student's care plan with parents/caregivers, the student's pediatrician or other clinical provider, and other school staff, including teachers.
  - Engage parents/caregivers about strategies for managing asthma. Ask parent/caregivers to complete a release of information form to allow bi-directional communication about the asthma plan.
  - Establish communication with the student's pediatrician or other clinical provider. Ask providers to send printed discharge instructions or other forms from the child's asthma control visits to the school nurse.
- Ensure healthy school environments for asthma management and control.
  - Follow RCW 28A.210.370 to ensure in-service training on asthma, adoption of policies for asthma rescue, and allow students to carry and self-administer prescribed asthma medication.
  - Adopt strategies to improve indoor air quality to reduce asthma triggers, including proper classroom air filtration systems to address air pollution and reduce exposure to respiratory viruses.
    - Refer to ASHRAE for indoor air quality guidelines for schools
  - Adopt strategies to address air pollution and outdoor smoke, including following the DOH's Outdoor Air Quality and School Activities guide, and ensuring a tobacco and vape free campus.
  - Follow AAP guidelines on school nurse staffing – employ at least one school nurse per building. Involve school nurses in air quality control plans and health plans.
- If the school has a school-based health center, offer asthma management and education services to students enrolled with the school-based health center (SBHC).
  - SBHC providers refer to the recommendations for clinicians for additional guidance on diagnosing and managing asthma.
  - Offer to administer asthma control medication on-site.
  - Provide follow-up care to students following an urgent care visit related to asthma.
  - Communicate the student's asthma control plan with the school nurse and other provider as necessary. Coordinate logistics of SBHC with school nurses.
    - Work with school nurses to run risk screening and update asthma care plan.

Clinical and Home Setting Coordination:

- Establish clear lines of communication with the patient's pediatrician or regular healthcare provider. Ask the parent/caregivers to complete a release of information form to allow bi-directional communication about the asthma plan.
  - Request printed discharge instructions or other forms from the child's asthma control visits to the school nurse.
  - Ask parents/caregivers to fill out release forms before the beginning of the school year.

- Work to standardize delivery system liability waivers to facilitate information sharing.

Recommendations for Payers and Purchasers

Funding:

- Cover the following services to improve asthma management and care:
  - Cover at least 2 – 3 spacers annually for patients with meter-dose inhalers. Include appropriate sized masks if needed. Allow for circumstantial exceptions to cover additional spacers given patient need.
  - Cover routine asthma control visits for patients with asthma.
  - Cover corticosteroids and rescue treatment for asthma patients, including dry powder inhalers.
  - Cover annual flu shots for children with asthma.
- Explore coverage for home-based spirometry devices, smart inhalers, and other symptom monitoring devices.
- Provide coverage for pediatric asthma services along the spectrum from fee for service to population-based payment, including advanced primary care payment models that include risk-adjustments.
  - For example, bundled payments focused on 30-60-90-days following acute asthma exacerbation for those with highest risk asthma that include home-based asthma interventions and education.
- Explore coverage for additional care coordination and in-lieu of services for patients with uncontrolled asthma.
  - In-home services by an asthma education professional (e.g., CHW) for environmental remediation of the home environment.
  - Explore coverage pathways for asthma trigger mitigation products like HEPA vacuums, green/non-toxic cleaners, impermeable mattress covers, portable air filtration devices, and air filters.
- Leverage the Health Care Authority's Medicaid 1115 waiver and Primary Care Transformation model to move toward population-based payment for asthma management.
  - Leverage health-related services payments to cover additional services for pediatric asthma patients.
  - Use pediatric asthma metrics and provide social need risk-adjustment to ensure high-quality asthma care in the primary care transformation model.

Clinical, Home, and School Setting Coordination:

- Provide outreach and education to pediatric asthma patients and their caregivers.
  - Target outreach to patients who are not picking up prescriptions (gaps in prescription coverage).
  - Provide education on disease self-management, including medication technique and adherence by a CHW or other health professional.
- Communicate with providers about medication adherence, emergency and inpatient utilization patterns, and gaps in care.

Recommendations for Public Health Agencies

Clinical Settings:

- Collect and report data on the number of pediatric asthma cases.
    - Develop and utilize pediatric asthma quality metrics to

Home Setting:

- Consider supporting community health worker programs, whether developing new public health programs, providing funding for community-based programs, or offering reimbursement for care coordination as a health-related service.
    - Home-based, multi-trigger, multicomponent interventions can reduce exposure to many indoor asthma triggers, offer environmental mitigation strategies, and motivational interviewing and goal setting to improve asthma self-management.
- Facilitate care coordination (whether home-based interventions, community-based organizations, or public health programs) to coordinate activities across care teams, including primary care providers, health plans, schools/childcare, and other service providers.
    - Care coordination programs should facilitate social service referral, with the goal of closed loop referrals. See the Bree Collaborative's Social Need and Health Equity report for further resources for care coordination.

School Environment:

- Consider expanding the school-based health center model to provide on-site medical services mindful of the school environment.
- Develop and update guidance for improving indoor (e.g. HVAC systems) and outdoor (e.g. source control) air quality in schools.
- Develop best practices for managing asthma at childcare centers.
- Advocate for legislation and funding to stock albuterol and spacers for school nurse offices, similar to current policy for epi pens.

Environmental Exposure:

- Provide education to the community about climate change, air pollution, and risks to health
- Develop preparedness and mitigation plans for extreme weather events – including wildfires, extreme heat/cold, and flooding.
- Offer programs to connect patients and caregivers to air filters and other climate mitigation products.
- Partner with weatherization programs from the Department of Commerce to provide products to improve air quality.
- Improve options for clean transportation including bikes, carpooling, zero-emission buses.
- Advocate for a climate lens in healthcare policy including funded programs and research to prepare for the health impacts of a changing climate.
- Remove requirement to use chlorine bleach as a disinfectant
- Promote adoption of the National Center for Healthy Housing's recommendations for air quality codes. Provide funding to encourage upgrades to meet air quality codes.

Recommendations for Patients and Community Members

- Learn more about managing pediatric asthma through resources like the CDC's asthma resources for kids, or the AAFA's asthma and allergy educational material for parents and caregivers.
- Manage exposure to air pollution, especially during times of high wildfire smoke.
- Consider purchasing an air filter or working with a community organization to receive a discounted air filter.
- Maintain a smoke-free environment in the home and in vehicles, including tobacco, marijuana, vaping. Minimize wood stove and fireplace use. Turn on fan whenever using a gas stove.

Review of Evidence

Clinical Environment

Clinical guidelines for asthma are well-established, including recommendations from the Global Initiative for Asthma (GINA) and the National Heart, Lung, and Blood Institute (NHLBI) out of the National Institutes of Health.[21,22] The NHLBI's National Asthma Education and Prevention Program Coordinating Committee convened their fourth expert panel working group to provide focused updates to their asthma guidelines in 2020. The updated guidelines focus on six priority topics including the use of fractional exhaled nitric oxide diagnostic tests, remediation of indoor allergens, adjustable medication dosing, long acting antimuscarinic agents, immunotherapy, and bronchial thermoplasty.[23]

Overall, the NHLBI guidelines offer steps to diagnose new asthma cases, assess asthma severity based on risk and impairment, develop asthma control plans including medication therapy, and planning for routine asthma control visits.[24] The NHLBI guidelines for asthma management are mostly the same for adults and pediatric populations, except for diagnosis. As children younger than 6 years cannot take a spirometry diagnostic test, the NHLBI recommends using a medical history and symptoms to confirm asthma diagnosis for this age group.[25]

The main asthma quality metric required by the Healthcare Effectiveness Data and Information Set (HEDIS) is the asthma medication ratio (AMR), which assesses adults and children 5–64 years of age who were identified as having persistent asthma and had a ratio of controller medications to total asthma medications of 0.50 or greater during the measurement year.[26] One study of children on Medicaid found that the AMR reliably predicted asthma exacerbations.[27] Alternatively, this workgroup suggests measuring the frequency of bronchodilator prescription refills to track population health. Bronchodilators serve as rescue inhalers for treating sudden asthma symptoms. Measuring the frequency of bronchodilator prescription refills can help track patients who are using their rescue inhaler more than recommended.

This workgroup offers a few clinical recommendations that extend beyond the NHLBI. Specifically, this workgroup recommends appropriate telehealth visits for routine asthma control visits and asthma education, depending on the patient's level of asthma control and in line with the Bree Collaborative's 2021 Telehealth Guidelines.[28] Additionally, this workgroup recommends making dry powder inhalers available for children and youth who have the lung capacity to tolerate them. Several studies have demonstrated that dry powder inhalers are as effective as pressurized meter dose inhalers in controlling asthma, but can reduce the carbon footprint by half.[29,30]

Home Environment

Home-based multi-trigger, multicomponent interventions can reduce exposure to multiple indoor asthma triggers (allergens and irritants).[31] These interventions involve home visits by trained personnel to:

- Assess the home environment and change the indoor environment to reduce exposure to asthma triggers through processes including mold removal, pest management, allergen management, encouraging smoke-free behaviors, and connecting families to air filters.
- Provide education about the home environment

Home-based asthma interventions may also include other activities to address patient and caregivers' barriers to receiving asthma care. Additional activities may include:

- Training, motivational interviewing, and goal setting to improve asthma self-management
- General asthma education on self-care including medication adherence, inhaler technique, symptom management, and trigger assessment/reduction
- Social services and support, including coordinated care for the asthma client such as referrals to resources and legal/housing assistance
- Combine asthma-related interventions with other health interventions, such as teaching lead-poisoning prevention and offering vaccinations.

The Community Preventative Services Task Force (CPSTF), a program of the US Department of Health and Human Services strongly recommends home-based multi-trigger, multicomponent interventions as an evidence-based intervention to address asthma. More than 22 studies have demonstrated that home-based interventions reduce asthma symptom days, days of school missed, acute healthcare visits, and increase pulmonary function.[32] Additionally, the Asthma and Allergy Foundation of America have identified home-based interventions as a key strategy for reducing asthma disparities, especially for low-income and BIPOC communities.[33] In Washington state, the Heathy Homes program out of Public Health of Seattle and King County has demonstrated that a home-based program supported by community health workers can reduce asthma morbidity.[34,35]

Successful home-based interventions share several key components including face-to-face components (virtual or in-person), tailoring the program diverse populations, and addressing behavioral and social drivers of asthma disparities. NCQA/Penn Medicine offer additional guidelines for supporting successful community health worker interventions.[36] Home-based community health worker programs may also present the opportunity to address patient and caregiver's social needs. See the Bree Collaborative endorsed recommendations on addressing social needs and health equity for more information.[37]

While many home-visits have shifted to virtual settings during the pandemic, the evidence-base for virtual home visits is still developing. For now, the workgroup recommends using established resources for virtual home-based interventions while reviewing the evidence-base. One established resource for virtual home visits is the Regional Asthma Management and Prevention (RAMP) and National Center for Healthy Housing's e-learning modules.[38] More information can be found here.

While home-based multi-trigger, multicomponent interventions are effective in managing asthma, this workgroup recommends reserving home-based interventions for patients with uncontrollable asthma. If patients are admitted to the hospital for poorly controlled asthma they should be referred to home-based interventions or care coordinator services when available.

School Environment

Schools are an essential partner to help address pediatric asthma, as students are expected to enroll in school from preK to 12th grade and school nurses are expected to develop individualized health plans (IHPs) for students with asthma. Additionally, RCW 28A.210.370 outlines requirements for school districts to develop policies to train staff to manage asthma and develop plans to provide asthma rescue treatment for students as needed.

Beyond the requirements, several organizations have developed guidelines for managing asthma in the school setting. The Asthma Management in the Schools Task Force, convened by the American Lung Association, the Office of the Superintendent of Public Instruction, the Department of Health, and School Nurses in Washington state developed a resource guide for asthma management in educational settings.[39] Additionally, the CDC have developed strategies for addressing asthma in schools and the National Schools Board Association have developed steps to address childhood asthma in the community.[40,41]

Full time school nurses are effective in improving student asthma management and reducing absenteeism.[42] Standard operating procedure for school nurses managing asthma includes providing asthma education, developing asthma care plans, and addressing potential asthma triggers to the best of their ability. The Asthma and Allergy Foundation of America provides templates for asthma action plans that can be communicated between clinics and schools.[43] One of the largest barriers to school-based asthma management is infrequent communication between clinics and schools.[44] This workgroup recommends increased communication and alignment across clinics and schools as a key component to improve holistic asthma management.

Beyond school nurses, school administration plays a role in improving asthma management in schools. School administration must provide training on asthma, adopt policies for asthma rescue care, and allow students to carry and self-administer prescribed asthma medication. In addition to what is required by the RCW, school administration can adopt strategies to reduce asthma triggers, including ensuring a tobacco and vape-free campus.[45] Additionally, school administration should refer to the Washington State Department of Health's (DOH) resources to address air pollution and outdoor smoke.[46] The DOH provides resources to guide appropriate activities during periods of poor outdoor air quality and smoke.[47] Finally, school administration can ensure each student has access to a school nurse by following AAP school nursing staffing guides and ensure each school site employs at least one full-time school nurse.[48]

School-based health centers are another option for providing asthma management and education services to children in the school environment. School-based health centers are effective in reducing the risk of hospitalization and ED visits for children with asthma.[49] Washington state is home to more than 65 school based health centers in over 25 school districts.[50] School based health centers can help administer asthma control medication, provide follow-up care to students following an urgent care visit, and provide additional asthma management education as needed.

Community Environment and Climate

The community environment can exacerbate asthma symptoms depending on the potential triggers present in the area. The CDC, the AAFA, and the APHA warn that climate change in particular will increase the burden of air pollution, allergens, and wildfires, all of which can trigger asthma symptoms.[51,52,53] Strong prevention and mitigation policies are needed to address the risk of climate change and the environment on asthma exacerbations.

The healthcare system in the US is responsible for 8.5% of total greenhouse gas emissions in the nation.[54] Many believe that it is important for healthcare to lead efforts to reduce emissions, partially because of the large share of emissions[55] and to improve healthcare resilience and equity.[56] To help healthcare organizations address climate change, the Health Care Climate Council offers a Climate Action Playbook for clinics and hospitals.[57]

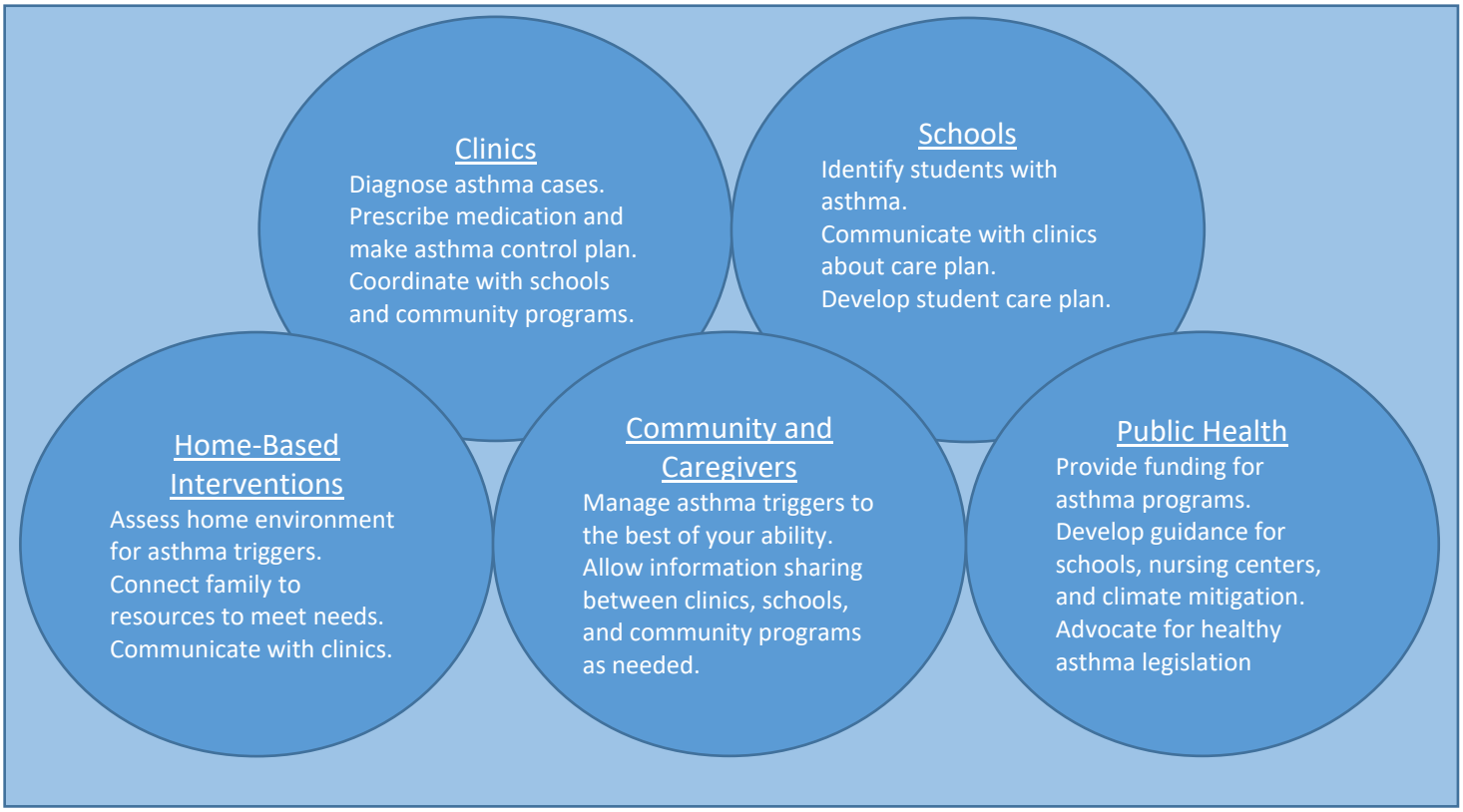
Programs that address air pollution, especially from wildfire smoke, will help improve asthma management. The Washington Department of Commerce offers a weatherization program for low-income homes that can help offset the cost of air filters to help manage wildfire smoke.[58] Policies that improve or regulate indoor air quality for schools, homes, or hospitals can also help manage asthma triggers.[59,60] Prompt action on climate mitigation and adaption will be essential to manage asthma with changing environments.

Funding

Effectively managing asthma requires a multisector that expands beyond the clinical walls. Funding mechanisms that address home-based interventions and encourage collaboration across healthcare, schools, and community sites are needed to further pediatric asthma control. The Brookings Institute highlighted several opportunities for innovative funding models in 2015 that include potential bundled payments or value based payments.[61,62]

Next Steps and Alignment

Washington state has been identified as having one of the highest asthma prevalence in the nation, with more than half a million adults and nearly 120,000 youth currently diagnosed with asthma.[63] While we don't know exactly what causes asthma, we can prevent asthma attacks or at least make them less severe.[64] In Washington, the largest gaps in effectively managing pediatric asthma include appropriate diagnosis of new cases and coordinating asthma care across multiple environments, including the clinical, home, and school environment. A model for communication across health care stakeholders is listed in **Figure 1.**



We hope this report supplements existing guidelines for pediatric asthma and outlines steps for future alignment across stakeholders. Each organization has a unique role to play to achieve control of pediatric asthma in Washington state. By working together to improve alignment across sectors we can reduce the burden of asthma in our state.

Appendix A: Bree Collaborative Members

Member	Title	Organization
Susie Dade, MS	Patient Advocate	
David Dugdale, MD, MS	Medical Director, Value Based Care	University of Washington Medicine
Gary Franklin, MD, MPH	Medical Director	Washington State Department of Labor and Industries
Stuart Freed, MD	Chief Medical Officer	Confluence Health
Mark Haugen, MD	Family Medicine	Walla Walla Clinic
Darcy Jaffe, MN, ARNP, NE-BC, FACHE	Senior Vice President, Safety & Quality	Washington State Hospital Association
Sharon Eloranta	Medical Director, Performance Measurement and Care Transformation	Washington Health Alliance
Norifumi Kamo, MD, MPP	Internal Medicine	Virginia Mason Franciscan Health
Angie Sparks, MD	Chief Medical Officer, Community Plan	UnitedHealthcare
Wm. Richard Ludwig, MD	Chief Medical Officer, Accountable Care Organization	Providence Health and Services
Greg Marchand	Director, Benefits & Policy and Strategy	The Boeing Company
Kimberly Moore, MD	Associate Chief Medical Officer	Franciscan Health System
Carl Olden, MD	Family Physician	Pacific Crest Family Medicine, Yakima
Drew Oliveira, MD	Executive Medical Director	Regence BlueShield
Mary Kay O'Neill, MD, MBA	Partner	Mercer
Kevin Pieper, MD	Chief Medical Officer	Kadlec Medical Center
Susanne Quistgaard, MD	Medical Director, Provider Strategies	Premera Blue Cross
John Robinson, MD, SM	Chief Medical Officer	First Choice Health
Jeanne Rupert, DO, PhD	Provider	The Everett Clinic
Hugh Straley, MD (Chair)	Retired	Medical Director, Group Health Cooperative; President, Group Health Physicians
Shawn West, MD	Medical Director	Embright, LLC
Judy Zerzan, MD, MPH	Chief Medical Officer	Washington State Health Care Authority

Appendix B: Pediatric Asthma Charter and Roster

The Bree Collaborative
Pediatric Asthma Charter and Roster

Problem Statement

Asthma is the most common chronic disease among children, with many potenital risk factors including smoking, obesity, family history, and environmental triggers, or adverse childhood experiences.[65] In Washington state nearly 120,000 children have been diagnosed with asthma, accounting for between 8 to 11 percent of children in middle and high school.[66] As asthma cannot be cured but can be effectively managed, there is a need for strong treatment and mitigation plans to prevent burden of disease among youth in Washington.

Aim

To increase evidence-informed screening, diagnosis, monitoring, and treatment for pediatric asthma to reduce the burden of disease in Washington state.

Purpose

To propose practical and evidence-informed recommendations to the full Bree Collaborative on reducing the burden of pediatric asthma including:

- Helping patients and families achieve asthma control.
- Appropriately diagnosing asthma cases and defining medically high-risk asthma.
- Improving access to and implementation of treatment protocols.
- Understanding and adapting treatment plans based on social determinants of health.
- Developing and adopting metrics for medication compliance and treatment process.
- Partnering with patients to ensure medication compliance and educate families.
- Engaging community support and broader public health programs.
- Addressing home, school, and community environments.
- Developing sustainable funding for pediatric asthma interventions.
- Improving care coordination between providers, plans, and community health supports.
- Disseminating and informing clinicians of ongoing evidence-based guidelines.

Duties & Functions

The workgroup will:

- Research evidence-informed and expert-opinion informed guidelines and best practices (emerging and established).
- Identify current barriers and future opportunities for implementing interventions.
- Consult relevant professional associations and other stakeholder organizations and subject matter experts for feedback, as appropriate.
- Maintain an equity lens while developing recommendations.
- Meet for approximately nine months, as needed.
- Provide updates at Bree Collaborative meetings.

- Post draft report(s) on the Bree Collaborative website for public comment prior to sending report to the Bree Collaborative for approval and adoption.
- Present findings and recommendations in a report.
- Recommend data-driven and practical implementation strategies including metrics or a process for measurement.
- Create and oversee subsequent subgroups to help carry out the work, as needed.
- Revise this charter as necessary based on scope of work.

Structure

The workgroup will consist of individuals confirmed by Bree Collaborative members or appointed by the chair of the Bree Collaborative. The Bree Collaborative director and program coordinator will staff and provide management and support services for the workgroup.

Less than the full workgroup may convene to: gather and discuss information; conduct research; analyze relevant issues and facts; or draft recommendations for the deliberation of the full workgroup. A quorum shall be a simple majority and shall be required to accept and approve recommendations to send to the Bree Collaborative.

Meetings

The workgroup will hold meetings as necessary. Bree Collaborative staff will conduct meetings, arrange for the recording of each meeting, and distribute meeting agendas and other materials prior to each meeting. Additional workgroup members may be added at the discretion of the Bree Collaborative director.

Name	Title	Organization
Annie Hetzel, MSN, RN	School Health Services Consultant	Office of the Superintendent of Public Instruction
Brad Kramer, MPA	Asthma and Community Health Worker Program Manager	Public Health, Seattle & King County
Christopher Chen, MD	Associate Medical Director	WA Health Care Authority
David Ricker, MD	Pediatric Pulmonologist	Mary Bridge Children's
Doreen Kiss, MD	Pediatrician/Peds Population Health	University of Washington
Edith Shreckengast, MS	Clinical Health Coach – Registered Dietitian	Community Health Plan of Washington
Julee Christianson	Health Schools Washington Director	Office of the Superintendent of Public Instruction
Kate Hastings	Senior Policy Expert	Scientific Consulting Group
Kate Guzowski		Community Health of Central Washington
Katie Paul, MD, MPH	Physician	Kaiser Permanente
LuAnn Chen, MD, MHA, FAAFP	Senior Medical Director	Community Health Plan of Washington
Mark LaShell, MD	Allergist-Immunologist	Kaiser Permanente
Michael Dudas, MD, FAAP	Pediatrician	Virginia Mason Medical Center

Vickie Kolios, MSHSA, CPHQ	Senior Program Director, Surgical COAP & Spine COAP	Foundation for Health Care Quality

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