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Closing the Asthma Care Gap: Lessons for the San Joaquin Valley

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Asthma as a Preventable Driver of Acute Care Use

Asthma remains one of the most common chronic respiratory diseases in the United States and continues to generate substantial morbidity, healthcare utilization, and avoidable disruption to daily life (Fuhlbrigge et al., 2002). Although asthma severity varies, many acute exacerbations do not arise solely from an unavoidable or unpredictable disease course. In many cases, worsening symptoms are linked to incomplete long-term control, inconsistent use of controller therapy, inadequate inhaler technique, poor recognition of early warning signs, absent written action plans, and gaps in timely outpatient follow-up. Current guideline frameworks therefore treat asthma exacerbation prevention as a core goal of care rather than a secondary objective. Reducing urgent care use depends not only on treating acute symptoms, but on preventing the sequence of failures that allows chronic instability to culminate in emergency department (ED) use (Global Initiative for Asthma, 2025).

ED reliance often reflects the cumulative consequences of poor day to day disease control. Global and U.S. guidelines emphasize that effective asthma management requires more than prescribing medication (Bateman et al., 2008). It also requires repeated assessment of symptom control and future risk, selection of appropriate controller therapy, review of inhaler technique, support for medication adherence, trigger reduction, and clear patient education regarding how to respond to worsening symptoms. When these elements are delivered consistently, exacerbations can often be reduced. When they are absent or fragmented, the ED may become the default site of asthma management. In this sense, acute care use is not only a marker of disease burden, but also a marker of breakdowns in preventive care delivery (Global Initiative for Asthma, 2025).

Underserved Communities and Unequal Asthma Outcomes

Asthma outcomes are not distributed evenly across the population. National surveillance data continue to show persistent disparities in asthma prevalence, asthma attacks, healthcare use, and mortality across lines of race, ethnicity, age, insurance status, and socioeconomic position. Children and adults facing barriers related to healthcare access, economic instability, or structural disadvantage are more likely to experience poorly controlled asthma and more likely to rely on acute care once symptoms worsen. These disparities cannot be understood through biological differences alone and instead reflect the interaction between chronic disease management and social and structural determinants of health (Pate and Zahran, 2024).

In underserved communities, the burden of asthma is often intensified by barriers that operate across multiple levels of care. At the healthcare-system level, patients may encounter limited primary care access, long wait times, transportation challenges, inadequate specialist availability, and poor continuity after emergency visits. At the household level, families may face medication affordability concerns, unstable housing conditions, crowded living environments, and competing financial or caregiving demands that make preventive care difficult to sustain. At the patient level, adherence may be compromised by limited health literacy, misunderstanding of controller versus rescue medications, or inadequate instruction in inhaler technique. These factors do not function in isolation. Rather, they reinforce one another and increase the likelihood that asthma will be managed episodically instead of proactively (Pate and Zahran, 2024).

The persistence of unequal asthma outcomes despite well-established management guidelines suggests that the central challenge lies not only in clinical knowledge, but also in implementation. Many of the interventions most strongly associated with reduced acute care use are not single medications or isolated educational materials, but multicomponent strategies that

address both clinical management and the social context in which self-management occurs. Recent systematic reviews have shown that interventions incorporating social risk reduction, family support, home-based trigger management, and community linkage are associated with decreases in asthma-related ED visits and hospitalizations among children (Tyris et al., 2022).

Why the San Joaquin Valley Matters

The San Joaquin Valley offers an important regional context for examining preventable asthma exacerbations and ED reliance. Prior research has identified the Valley as a region marked by concentrated poverty, low healthcare access, and substantial pediatric asthma burden. In a multilevel study of pediatric asthma hospital care use in California's San Joaquin Valley, Alcala et al. (2018) explicitly described the region as one with a history of poverty, limited healthcare access, and high rates of pediatric asthma, and showed that neighborhood-level concentrated poverty modified the relationship between insurance coverage and asthma-related ED visits and hospitalizations. Their findings suggest that asthma outcomes in the region cannot be understood apart from the broader structural conditions that shape access to preventive care (Alcala et al., 2018).

County-level and regional reports further reinforce the relevance of this setting. A California Department of Public Health county profile for Merced reported asthma ED visit rates in 2014 that exceeded the California average overall and were especially elevated among young children aged 0 to 4 years (California Department of Public Health, 2016). A regional report on children in the San Joaquin Valley similarly noted that asthma-related emergency room visit rates among children were above the state average in Merced, Kings, Kern, and Fresno counties, underscoring that pediatric asthma-related acute care use is not an isolated county phenomenon

but a broader Valley concern (Hartzog et al., 2017). Together, these data support the San Joaquin Valley as a meaningful case through which to consider how underserved conditions contribute to preventable acute care dependence. The relevance of the San Joaquin Valley is therefore not merely geographic; it is conceptual. The region illustrates how asthma morbidity becomes amplified when clinical best practices are delivered within environments shaped by access barriers, economic strain, and fragmented continuity of care. For a journal based at UC Merced, this regional lens adds more than local context. It grounds the review in a setting where the stakes are immediate, where the burden is documented, and where evidence-based strategies for reducing ED reliance are likely to have practical significance for clinicians, educators, families, and public health systems (Alcala et al., 2018).

Review Objective

This review examines why preventable asthma exacerbations and ED visits remain common in underserved communities despite the existence of established management guidelines. Rather than treating asthma-related emergency care as an inevitable consequence of disease severity, this paper approaches ED reliance as the result of repeated failures across the asthma care pathway, including inconsistent preventive treatment, inadequate self-management support, environmental and household barriers, weak follow-up systems, and broader social risk. The goal is not only to describe why these failures occur, but also to assess which intervention models have shown the strongest evidence for improving control and reducing acute care use (Global Initiative for Asthma, 2025; Tyris et al., 2022).

Using the San Joaquin Valley as a motivating regional framework, this review argues that the most promising strategies are those that extend asthma management beyond the clinic and

strengthen continuity across the settings where care is actually sustained. In doing so, the paper aims to synthesize the literature in a way that is both analytically rigorous and regionally relevant. The central question guiding this review is: why do preventable asthma exacerbations and ED visits remain high in underserved communities despite established guidelines, and which evidence-based interventions are most relevant to regions such as California's San Joaquin Valley (Alcala et al., 2018; Global Initiative for Asthma, 2025; Tyris et al., 2022)?

Failures Across the Asthma Care Cascade

From Diagnosis to Long-Term Control

Preventable asthma exacerbations rarely result from a single failure. More often, they emerge from breakdowns across a care cascade that begins with accurate diagnosis and extends through long-term management. Effective asthma control depends on appropriate controller therapy together with ongoing assessment of inhaler technique, adherence, and risk over time. As shown in Figure 1, failures at any point in this cascade can compound over time and ultimately culminate in preventable ED use. When these elements are not addressed consistently, exacerbation risk and acute care use become more likely (Global Initiative for Asthma, 2025; Cloutier et al., 2020).

Guidelines emphasize that asthma assessment should address not only symptom burden, but also exacerbation history, lung function, and future risk. This matters because patients who seem stable at a single visit may still remain vulnerable to severe exacerbations if inflammation is poorly controlled or modifiable risks are left unaddressed. Long-term control therefore depends on more than an initial prescription. It requires choosing an appropriate regimen, adjusting therapy when control is inadequate, and reassessing response over time rather than

assuming that access to medication alone will produce stability (Global Initiative for Asthma, 2025; National Heart, Lung, and Blood Institute, 2020).

The care cascade framework also helps explain why ED reliance persists even when treatments are technically available. A patient may be prescribed inhaled corticosteroids yet remain poorly controlled if the diagnosis is uncertain, the device is mismatched to the patient's needs, the inhaler technique is incorrect, refill access is inconsistent, or follow-up is too limited to detect worsening disease early. Prior work has shown that poor inhaler technique and nonadherence reduce the real-world effectiveness of asthma therapy, while more recent qualitative research shows that adherence is shaped by medication beliefs, communication with healthcare professionals, access to adequate information, and patients' day to day behaviors and barriers to self-management (Kaplan et al., 2018; Zhang et al., 2023).

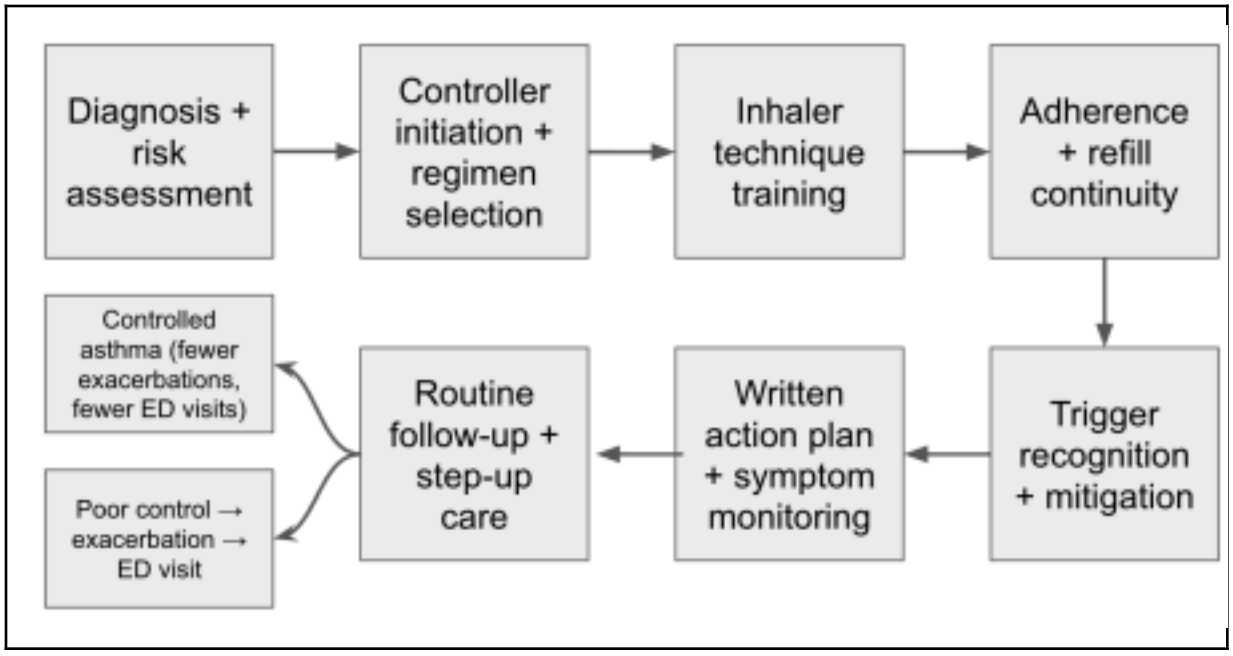

Figure 1. Asthma care cascade and failure points leading to ED reliance. Key breakdowns in preventive management can result in poor control, exacerbations, and emergency department use

in underserved communities.

Guideline Recommendations and Real-World Gaps

Modern asthma guidelines present a clear prevention-oriented model of care. The Global Initiative for Asthma (GINA) recommends ongoing assessment of symptom control, adherence, inhaler technique, environmental exposures, and comorbidities, while the 2020 National Heart, Lung, and Blood Institute (NHLBI) focused updates preserve core principles such as asthma education, self-management support, and regular follow-up. Together, these guidelines reflect broad agreement that asthma care should be longitudinal and preventive rather than episodic and reactive (Global Initiative for Asthma, 2025; National Heart, Lung, and Blood Institute, 2020; Cloutier et al., 2020).

In practice, however, guideline-concordant care is often delivered inconsistently. The NHLBI clinician's guide explicitly advises clinicians to check adherence, inhaler technique, environmental factors, and comorbid conditions before stepping up therapy, underscoring how often these modifiable barriers interfere with control. This gap is especially visible in inhaled therapy, where treatment success depends not only on the medication itself, but also on patient-device fit, dexterity, inspiratory capacity, health literacy, and sustained use. Improper inhaler technique has been linked to poor control and frequent ED visits, while poor adherence to controller therapy is associated with greater risk of severe exacerbations (Kaplan et al., 2018; Engelkes et al., 2015).

Taken together, these gaps support a central argument of this review: preventable asthma exacerbations persist not because evidence-based guidance is absent, but because guideline-recommended care is not consistently delivered across the full care pathway. In underserved communities, where cost, access, follow-up, and social constraints compound one

another, missed opportunities for specialist evaluation or treatment escalation can leave worsening asthma inadequately managed until acute care becomes necessary (Global Initiative for Asthma, 2025; Carr et al., 2024).

Why Preventable Exacerbations Persist

Barriers to Preventive Care Access

Preventable asthma exacerbations persist in part because preventive care is often difficult to access consistently, especially in underserved communities. Effective asthma management depends on regular outpatient visits, timely adjustment of controller therapy, education on symptom monitoring, and follow-up after acute episodes. In practice, however, families may face transportation barriers, limited primary care availability, insurance instability, long wait times, and fragmented continuity between emergency and outpatient settings. These obstacles shift asthma care away from longitudinal prevention and toward episodic treatment after symptoms have already worsened. National and regional literature on asthma disparities has repeatedly shown that structural disadvantage and inconsistent access to routine care are closely linked to worse asthma outcomes and greater reliance on urgent services (Pate and Zahran, 2024; Alcala et al., 2018).

These barriers matter because asthma control is not maintained through one-time treatment. It requires repeated contact with a system that can assess control, reinforce self-management, and respond early to deterioration. When families cannot easily obtain preventive visits, controller refills, or timely reassessment, the ED may become the most reliable point of contact with the healthcare system. In that setting, acute symptoms can be treated, but the conditions that led to poor control are often left unresolved (Global Initiative for Asthma,

2025; Skene et al., 2023).

Medication Adherence and Inhaler Technique

Even when appropriate medications are prescribed, asthma control depends on whether those medications are taken consistently and delivered correctly. Poor adherence to inhaled corticosteroids remains a major contributor to severe exacerbations, and reviews of pediatric asthma have shown that adherence is shaped not only by forgetfulness, but also by caregiver beliefs, competing routines, misunderstanding of daily controller therapy, and wider family or community pressures (Engelkes et al., 2015; Gray et al., 2018). In underserved settings, these problems may be intensified by cost barriers, interrupted pharmacy access, and limited time for clinician education during routine visits.

Inhaler technique presents a parallel problem. An inhaler may be prescribed appropriately yet still fail in practice if the patient cannot coordinate its use, generate the necessary inspiratory effort, or remember the steps involved. Improper technique has been associated with poor asthma control and more frequent ED visits, suggesting that the real-world benefit of inhaled therapy depends heavily on education, reinforcement, and device selection rather than medication choice alone (Al-Jahdali et al., 2013; Kaplan et al., 2018). In low-income and other high-risk populations, this issue may be particularly consequential because technical errors in medication delivery can persist for long periods without being identified or corrected (Gleeson et al., 2019).

Household and Environmental Triggers

Asthma symptoms are also shaped by the environments in which patients live. Household exposures such as pests, dust, mold, tobacco smoke, pet dander, and other irritants can undermine otherwise appropriate medical management by maintaining chronic airway inflammation or

provoking recurrent symptoms. This is especially important for children, who

spend substantial time indoors and may have little control over their home environment. Reviews of home-based asthma interventions have emphasized that many exacerbation triggers are clustered in the household and that reducing exposure to multiple triggers, rather than addressing a single allergen in isolation, is often necessary for meaningful improvement (Crocker et al., 2011; Hogaard et al., 2025).

These exposures are not evenly distributed. Families living in lower-resource settings may have less control over housing quality, moisture problems, pest infestations, or smoking exposure in shared living environments. As a result, environmental trigger reduction can be difficult to achieve without external support. The Community Guide has therefore endorsed home-based, multi-trigger, multicomponent interventions for children and adolescents with asthma, reflecting evidence that household assessment, education, and practical remediation can reduce asthma morbidity when combined rather than delivered as isolated advice (The Community Guide, n.d.; Turcotte et al., 2014).

School, Work, and Family-Level Barriers

For children and adolescents, asthma management extends beyond the clinic and home into the school setting, where symptoms, medication access, and attendance-related consequences can all affect control. Recent review literature has shown that asthma contributes substantially to school absenteeism and that educational disruption is intertwined with acute care use, family stress, and inadequate preventive management (Merghani et al., 2025). School systems can help stabilize asthma through medication access, symptom monitoring, and communication with families, but barriers such as limited nurse staffing, insufficient resources,

and weak coordination with healthcare providers often reduce this capacity (Lineberry and Ickes, 2015).

Family-level pressures can further complicate self-management. Caregivers may need to balance work schedules, transportation constraints, pharmacy access, and the demands of caring for multiple family members. These competing pressures can make it difficult to maintain follow-up appointments, supervise daily controller use, or respond early to worsening symptoms. In underserved populations, structural inequities and social stressors therefore shape asthma outcomes not only through healthcare access, but also through the practical realities of daily family life (Bellin et al., 2017).

The Self-Reinforcing Cycle of ED Reliance

Once these barriers accumulate, ED reliance can become self-reinforcing. Acute episodes are treated in the ED, but patients may then return to the same home, school, and healthcare environments that contributed to poor control in the first place. Without reliable follow-up, inhaler review, adherence support, action planning, and attention to household triggers, the underlying drivers of instability remain in place. Reviews of interventions delivered in the ED suggest that post-ED support can improve asthma outcomes, but the persistence of repeat visits indicates that acute care alone rarely corrects the full set of upstream failures (Skene et al., 2023).

For this reason, preventable exacerbations should not be understood solely as failures of individual behavior or isolated clinical management. They are often the product of cumulative breakdowns across the asthma care pathway, compounded by housing, family, school, and access-related challenges. In underserved communities, the ED becomes not just a site of rescue,

but the endpoint of a fragmented system that has failed to maintain control earlier and more effectively (Pate and Zahran, 2024; Global Initiative for Asthma, 2025).

Evidence-Based Strategies to Reduce Emergency Department Use

Supported Self-Management and Written Action Plans

Among the most consistently supported asthma interventions are those that strengthen self-management rather than relying on medication prescriptions alone. Supported self-management usually includes asthma education, reinforcement of inhaler technique, routine review of symptom patterns, and a written asthma action plan that helps patients and families respond early to worsening control. A major meta-review found that self-management support reduced unscheduled healthcare use when it was paired with regular professional review, suggesting that written plans are most effective when embedded within an ongoing care relationship rather than delivered as isolated documents (Pinnock et al., 2017). Evidence focused specifically on action plans after emergency care is somewhat more mixed, but studies with lower risk of bias have still suggested benefit, particularly when plans are paired with education and follow-up rather than discharge paperwork alone (Kew et al., 2017).

Community Health Workers and Home-Based Interventions

Community health workers and home-based interventions are especially important in underserved settings because they address the gap between clinic recommendations and real-life barriers. Rather than focusing only on medication, these programs often combine family education, home trigger assessment, navigation support, and linkage to community resources. A systematic review and meta-analysis of social risk interventions for pediatric asthma found

reductions in ED visits and hospitalizations, with the strongest results seen when interventions addressed multiple domains at once, including health, environment, and community context (Tyris et al., 2022). Similarly, a review of community interventions found that care coordination, home-based services, and policy or environmental approaches were associated with lower acute care use in childhood asthma (Gill et al., 2022). These findings suggest that effective prevention in high-risk communities often depends on addressing the lived conditions that make guideline-based care difficult to sustain.

School-Linked Asthma Programs

School-linked asthma interventions are also promising because they bring management support into a setting where children spend much of their time. Schools can improve asthma outcomes through medication access, symptom monitoring, education, and communication with families and healthcare providers. Their importance is even greater in underserved communities, where transportation and scheduling barriers may limit clinic-based follow-up. Evidence from school-based telehealth programs has shown meaningful reductions in ED use among children with asthma, indicating that school-linked care can improve continuity and reduce reliance on crisis-driven treatment (Bian et al., 2019). More recent work has also highlighted the value of models that connect schools, families, and clinics through community health workers, further reinforcing the importance of cross-setting coordination (Bryant-Stephens et al., 2024).

Telehealth and Digital Support Tools

Telehealth and digital tools may help reduce access-related barriers, although their benefits appear strongest when used to support broader systems of care rather than as stand-alone

solutions. Telehealth can improve follow-up after exacerbations, increase access to education and monitoring, and reduce transportation burdens for families. Digital inhaler systems and other adherence-support tools may also improve controller use and disease monitoring. Recent evidence suggests that these technologies can improve asthma control and may reduce severe exacerbations, but the benefits are generally more modest and less consistent than those seen with multicomponent community-based interventions (Ologundudu et al., 2025). For underserved populations, technology may therefore be most useful as a supplement to coordinated care rather than a substitute for it.

Post-ED Follow Up and Quality Improvement Strategies

Because many high-risk patients continue to cycle through acute care, interventions after ED visits are particularly important. Post-ED strategies aim to turn an acute episode into an opportunity to restore preventive care through discharge education, medication review, action planning, and prompt outpatient follow-up. A recent review of ED-based asthma interventions found that these approaches can improve downstream outcomes, but also noted that the evidence is heterogeneous and that success often depends on whether the ED encounter is effectively linked to continuing care afterward (Skene et al., 2023). Clinic-based quality improvement efforts have shown similar value. A pediatric primary care project reported sustained reductions in asthma-related emergency visits after implementing structured improvements in high-risk asthma management, suggesting that system-level changes in follow-up and chronic care delivery can reduce acute care dependence over time (Hersey et al., 2023). Together, these studies support a broader conclusion: the most effective strategies are those that connect acute

care, outpatient care, and community support into a more continuous system of asthma management.

Lessons for the San Joaquin Valley

Translating Evidence to a Regional Context

The literature reviewed in this paper suggests that preventable asthma exacerbations are rarely the product of a single clinical failure. Instead, they arise when repeated weaknesses across the care pathway interact with the social and structural conditions of daily life. This is precisely why the San Joaquin Valley provides such an important regional lens. In the Valley, pediatric asthma burden has been documented alongside persistent barriers related to poverty, healthcare access, and neighborhood disadvantage, making it difficult for families to sustain the kind of continuous preventive management that asthma control requires (Alcala et al., 2018). Available county and regional profile data indicate that Merced County and several San Joaquin Valley counties have historically experienced pediatric asthma ED visit rates above the California average, reinforcing that the region's relevance is measurable rather than theoretical (California Department of Public Health, 2016).

What makes the San Joaquin Valley especially important is that it illustrates how evidence-based asthma care can remain difficult to deliver even when clinical guidelines are clear. In a region where families may face transportation challenges, limited continuity of care, competing economic pressures, and variable access to preventive services, recommendations such as routine follow-up, inhaler review, written action plans, and trigger reduction are more difficult to implement consistently. The Valley therefore should not be viewed simply as a place with a high asthma burden. It should be understood as a setting in which the distance between

Recommended care and achievable care are likely to be especially consequential. For a review focused on preventable exacerbations, this distinction matters because it shifts attention away from asthma as an abstract chronic disease and toward asthma as a condition whose outcomes are shaped by whether systems can reliably support prevention in real-world settings (Global Initiative for Asthma, 2025; Pate and Zahran, 2024).

The Most Promising Intervention Models

When the intervention literature is viewed through a San Joaquin Valley lens, a clear pattern emerges. The strongest models are not those that depend on a single educational session or a narrow medication adjustment. Instead, the most promising approaches are multicomponent interventions that improve coordination across the everyday settings in which asthma management actually occurs. Systematic reviews have shown that community-based interventions, social risk interventions, and home-linked programs are associated with reductions in asthma-related ED visits and hospitalizations, especially when they address multiple barriers at once rather than isolating one variable such as medication adherence alone (Tyris et al., 2022; Gill et al., 2022).

For the San Joaquin Valley, this has direct implications. First, community health worker and home-based models appear highly relevant because they extend asthma management beyond the clinic and address the household conditions that often undermine control. These interventions are particularly important in lower-resource settings where trigger reduction, health literacy, and care navigation may all require active support rather than passive advice. Second, school-linked programs are especially promising in a region where pediatric burden is substantial and where schools may offer one of the most stable points of contact for children with chronic disease.

Evidence from school-based telehealth and school-clinic linkage programs suggests that bringing asthma support into the educational environment can improve continuity and reduce emergency care use (Bian et al., 2019; Bryant-Stephens et al., 2024).

Third, post-ED follow-up strategies deserve special emphasis. In underserved communities, an ED visit should not be treated as the endpoint of asthma care, but as a warning that the preventive system has failed. The literature suggests that the greatest value of post-ED intervention lies not simply in discharge instructions, but in re-establishing the patient within a longitudinal care pathway that includes controller review, inhaler technique assessment, action planning, and timely follow-up. Quality improvement studies further suggest that when clinics build structured systems for identifying and managing high-risk asthma patients, emergency visits can decline over time (Skene et al., 2023; Hersey et al., 2023).

A Minimum Viable Asthma Support Framework

Taken together, this literature supports the idea that the San Joaquin Valley would likely benefit most from a minimum viable asthma support framework rather than a single flagship intervention. Such a framework would not require a novel therapy. Instead, it would focus on delivering established evidence-based practices more consistently across the settings where breakdowns currently occur. At minimum, this would include reliable controller-based outpatient management, repeated inhaler technique review, written asthma action plans, and structured follow-up after acute care visits, all of which are already central to major asthma guidelines (Global Initiative for Asthma, 2025; National Heart, Lung, and Blood Institute, 2020).

However, the evidence reviewed here suggests that clinic-based care alone is unlikely to be sufficient. A minimal regional framework should also include mechanisms that link families

to home-based trigger assessment or education, integrate schools into symptom monitoring and medication continuity where feasible, and use community health workers or other navigators to bridge gaps in understanding, logistics, and follow-up. Telehealth may also play a useful supplementary role by making reassessment and education easier to access, particularly when transportation or scheduling barriers would otherwise delay care. Importantly, the value of these components lies not in their novelty, but in their coordination. The intervention literature suggests that reductions in ED reliance are most likely when asthma care becomes more continuous, reinforced, and context-sensitive rather than fragmented and reactive (Tyris et al., 2022; Ologundudu et al., 2025).

For the San Joaquin Valley, the central lesson is straightforward. Evidence-based asthma management is well established, but in underserved regional contexts the systems needed to deliver it consistently are often weak, fragmented, or difficult to access. A publishable and policy-relevant interpretation of the literature is that reducing asthma-related ED use in the Valley will likely depend less on discovering new treatments than on building reliable connections among outpatient care, family support, school systems, and post-acute follow-up. That conclusion is both scientifically grounded and regionally meaningful, which is precisely what makes the San Joaquin Valley such a compelling setting for this review (Alcala et al., 2018; Global Initiative for Asthma, 2025; Gill et al., 2022).

Gaps in the Literature and Future Directions

Although the literature on asthma disparities and intervention strategies is substantial, several important gaps remain. First, much of the strongest intervention evidence comes from pediatric populations, urban settings, or tightly designed multicomponent programs, which can

make it difficult to determine which findings are most transferable to semi-rural or regionally underserved areas such as the San Joaquin Valley (Tyris et al., 2022; Gill et al., 2022). More place-sensitive research is needed to understand how barriers related to transportation, continuity of care, school resources, and healthcare workforce shortages shape asthma management in communities outside large metropolitan systems (Alcala et al., 2018).

Second, the intervention literature is often heterogeneous in both design and outcome measurement. Programs may combine education, home visits, care coordination, trigger reduction, and follow-up support in different ways, making it difficult to isolate which individual components drive the greatest reductions in ED use (Skene et al., 2023; Pinnock et al., 2017). This complexity does not weaken the evidence for multicomponent care, but it does limit direct comparison across studies and makes implementation planning more difficult.

Finally, future work should move beyond asking whether guideline-based care is effective and instead focus on how to deliver it reliably in underserved settings. In regions such as the San Joaquin Valley, the most pressing research questions may concern implementation, sustainability, and coordination across clinics, schools, homes, and community systems rather than the discovery of entirely new therapies. A key future direction for both research and practice is therefore the development of scalable, context-sensitive asthma care models that reduce fragmentation and strengthen preventive support before worsening disease reaches the ED (Global Initiative for Asthma, 2025; Hersey et al., 2023).

Conclusion

Preventable asthma exacerbations and ED reliance remain persistent features of asthma care in underserved communities, not because the principles of effective management are

unclear, but because those principles are difficult to deliver consistently across the settings in which asthma is actually lived and managed. The literature reviewed here suggests that emergency care dependence is best understood as the downstream result of repeated failures across the asthma care pathway, including inconsistent preventive follow-up, poor adherence support, inadequate inhaler technique review, unresolved household triggers, and weak coordination among clinics, families, schools, and community systems (Global Initiative for Asthma, 2025; Cloutier et al., 2020; Pate and Zahran, 2024).

Viewed through the lens of the San Joaquin Valley, this problem becomes especially significant. The region's documented pediatric asthma burden, healthcare access challenges, and broader structural inequalities make it a compelling example of how social conditions can magnify the consequences of fragmented chronic disease management (Alcala et al., 2018; California Department of Public Health, 2016). For this reason, the most meaningful lesson from the literature is not that underserved communities require entirely new asthma therapies. Rather, they require stronger systems for delivering existing evidence-based care in ways that are continuous, accessible, and responsive to the realities of daily life.

The most consistently supported interventions are those that move beyond isolated clinical encounters and instead connect preventive treatment with home-based support, school-linked management, post-emergency follow-up, and community-based coordination (Tyris et al., 2022; Gill et al., 2022; Hersey et al., 2023). In the San Joaquin Valley, reducing asthma-related ED use will likely depend less on novel pharmacologic advances than on stronger systems for delivering preventive care consistently. This conclusion is both scientifically grounded and regionally urgent, and it underscores that asthma is not only a clinical issue, but

also a test of whether preventive care can be made reliably accessible in underserved communities.

Key Terms

Term	Definition
Asthma exacerbation	An acute or subacute worsening of asthma symptoms and airflow limitation that may require additional treatment or urgent care.
Asthma care cascade	A stepwise model of asthma management from diagnosis through long-term control, emphasizing where breakdowns can lead to exacerbations.
Controller therapy	Long-term medication, usually including inhaled corticosteroids, used regularly to reduce airway inflammation and prevent asthma symptoms and exacerbations.
Emergency department reliance	Repeated dependence on the emergency department for asthma management, often reflecting weak preventive care and poor long-term control.
Guideline-concordant care	Care that is delivered in a way that aligns with established clinical recommendations, such as those from Global Initiative for Asthma (GINA).
Inhaler technique	The method a patient uses to take inhaled medication. Poor technique can reduce how much medication reaches the lungs and weaken treatment effectiveness.
Medication adherence	The degree to which a patient takes prescribed medication as directed in a consistent and sustained way.

Multicomponent intervention	An intervention that combines several strategies, such as education, home visits, care coordination, and follow-up, rather than relying on a single action alone.

Self-management support	Education and tools that help patients and families monitor symptoms, use medicines correctly, avoid triggers, and respond early to worsening asthma.

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