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JOURNAL articles

Susan m. Butler, et al. "Medication Use in Schools: Current Trends, Challenges, and Best Practices," (2020) Journal of Pediatric Pharmacology and Therapeutics, 25(1), 7-24, DOI: [10.5863/1551-6776-25.1.7](https://doi.org/10.5863/1551-6776-25.1.7)

There are a significant number of students on maintenance medications for chronic diseases or with diagnoses that may result in medical emergencies requiring administration of medications in school. With passing of legislation in all 50 states allowing self-administration of emergency medications for allergic reactions and asthma, the landscape of medication use in schools is changing. These changes have raised questions about the need for legislation or policy development relating to self-carrying and self-administration of medications for other disease states, undesignated stock of emergency medications, and administration of medications by non-medical personnel. **Medication administration in the school setting has become a complex issue, and this review will discuss current legislation related to medication use in schools and provide best practices for administering medications to children and adolescents while at school.**

Jose A. Castro-Rodriguez, Katia Albarca, and Erick Forno, “Asthma and the Risk of Invasive Pneumococcal Disease: A meta-analysis,” (2020) *Pediatrics*, 145(1), DOI: [10.1542/peds.2019-1200](https://doi.org/10.1542/peds.2019-1200)

Context: Invasive pneumococcal disease (IPD) and pneumonia are a leading cause of morbidity and mortality throughout the world, and asthma is the most common chronic disease of childhood. **Objective:** To evaluate the risk of IPD or pneumonia among children with asthma after the introduction of pneumococcal conjugate vaccines (PCVs). **Data sources:** Four electronic databases were searched. **Study selection:** We selected all cohorts or case-control studies of IPD and pneumonia in populations who already received PCV (largely 7-valent pneumococcal conjugate vaccine), but not 23-valent pneumococcal polysaccharide, in which authors reported data for children with asthma and in which healthy controls were included, without language restriction. **Data extraction:** Two reviewers independently reviewed all studies. Primary outcomes were occurrence of IPD and pneumonia. Secondary outcomes included mortality, hospital admissions, hospital length of stay, ICU admission, respiratory support, costs, and additional medication use. **Results:** Five studies met inclusion criteria; of those, 3 retrospective cohorts (~26 million person-years) and 1 case-control study ($N = 3294$ children) qualified for the meta-analysis. **Children with asthma had 90% higher odds of IPD than healthy controls (odds ratio = 1.90; 95% confidence interval = 1.63-2.11; $I^2 = 1.7\%$).** **Pneumonia was also more frequent among children with asthma than among controls,** and 1 study reported that pneumonia-associated costs increased by asthma severity. **Limitations:** None of the identified studies had information of asthma therapy or compliance. **Conclusions:** Despite PCV vaccination, children with asthma continue to have a higher risk of IPD than children without asthma. Further research is needed to assess the need for supplemental 23-valent pneumococcal polysaccharide vaccination in children with asthma, regardless of their use of oral steroids.

Kim Hartley, et al., “Effects of Greenness on Asthma in Children: A Systematic Review,” (2020) *Public Health Nursing*, DOI: [10.1111/phn.12701](https://doi.org/10.1111/phn.12701)

Greenness such as trees, plants, and shrubs may positively influence mental and physical health, but the relationship between greenness and asthma is poorly understood. Because asthma is the most prevalent child respiratory disease internationally, elucidating the role of greenness may substantially benefit public health. The purpose of this systematic review was to synthesize findings related to effects of greenness on asthma in children. Following PRISMA guidelines, six databases were searched for international publication of primary research results relevant to the relationship between greenness and child asthma. Of 82 initial results, seven articles remained after removal of duplicates and applying exclusion criteria. **Six reported no direct association between greenness and child asthma, while one found increased greenness protective for asthma.** None found a negative direct association between greenness and child asthma. **Evidence supported benefits of greenness on child asthma through mediation of factors such as exposure to tobacco smoke, high traffic volume, and difficult family relationships.**

Even without a direct association, greenness can be considered a public health asset as it may mediate other factors contributing to asthma in children. Public health nurses can use these findings to educate clients and partners while advocating for policies to protect greenness.

Rachelle R. Ramsey, et al. “Systematic Review of Digital Interventions for Pediatric Asthma Management,” (2019) Journal of Allergy and Clinical Immunology Practice, DOI: [10.1016/j.jaip.2019.12.013](https://doi.org/10.1016/j.jaip.2019.12.013)

Background: Pediatric patients with asthma only take approximately half of their prescribed medication. Digital interventions to improve adherence for youth with asthma exist and have the potential to improve accessibility, cost-effectiveness, and customizability. **Objective:** To systematically review published research examining digital interventions to promote adherence to the treatment of pediatric asthma. **Methods:** A systematic search of PubMed, Scopus, CINAHL, PsycINFO, and reference review databases was conducted. Articles were included if adherence was an outcome in a randomized controlled trial of a digital intervention for children with asthma. We compared samples, intervention characteristics, adherence measurement and outcomes, as well as additional health outcomes across studies. **Results:** Of the 264 articles reviewed, 15 studies met inclusion criteria and were included in the review. **Overall, 87% of the digital interventions demonstrated improved adherence and 53% demonstrated improved health outcomes.** All of the promising interventions included a behavioral component and the majority were 3-6 months in length, delivered through a digital stand-alone medium (e.g., automated personalized texts, mobile health apps, website), and assessed adherence to controller medication. **Conclusions:** Overall, digital interventions aimed at improving adherence are promising and also improve health outcomes in addition to medication adherence. Although future studies using evidence-based adherence assessment and multi-factorial design should be conducted, **the current literature suggests that both digital stand-alone interventions and interventions combining digital technology with support from a healthcare team member result in improved adherence and asthma outcomes.** Recommendations for digital interventions for pediatric asthma patients with adherence concerns are provided.

Johanna Krusche, Sarah Basse, and Bianca Schaub, “The Role of Early Life Immune Regulation in Asthma Development, (2019) Seminal Immunopathology, DOI: [10.1007/s00281-019-00774-z](https://doi.org/10.1007/s00281-019-00774-z)

Development of childhood asthma is complex with a strong interaction of genetic, epigenetic, and environmental factors. Ultimately, it is critical how the immune system of a child responds to these influences and whether effective strategies for a balanced and healthy immune maturation can be assured. Pregnancy and early childhood are particularly susceptible for exogenous influences due to the developing nature of a child's immune system. While endogenous influences such as family history and the genetic background are immutable, epigenetic regulations can be modulated by both heredity and environmental exposures. Prenatal influences such as a mother's nutrition, smoking, or infections influence the complex interplay of

innate and adaptive immune regulation as well as peri- and postnatal influences including mode of delivery. Early in life, induction and continuous training of healthy maturation include balanced innate immunity (e.g., via innate lymphoid cells) and an equilibrium of T-cell subpopulations (e.g., via regulatory T cells) to counter-regulate potential pro-inflammatory or exuberant immune reactions. Later in childhood, rather compensatory immune mechanisms are required to modulate deviant regulation of a child's already primed immune trajectory. **The specific effects of exogenous and endogenous influences on a child's maturing immune system are summarized in this review, and its importance and potential intervention for early prevention and treatment strategies are delineated.**

In the NEWS

Drew Costley, "[The blackest city in the US is facing an environmental justice nightmare,](#)" The Guardian, Jan 9, 2020

Brandon May, "[Asthma, Eczema Risk Increases Among Children Exposed to Air Pollution,](#)" Pulmonology Advisor, Jan 8, 2020

Arin Allday, "[Bay Area doctors target health consequences of childhood trauma,](#)" San Francisco Chronicle, Jan 5, 2020

MHE Staff, "[Population Health Strategies Benefit Kids on Medicaid,](#)" Managed Health Care Executive, Jan 3, 2020.

Nicholas Bakalar, "[Antibiotics May Raise the Risk of Allergies,](#)" The New York Times, Dec 31, 2019

Elizabeth Heubeck, "[Kids' 'Microbiome' May Play Key Role in Asthma,](#)" U.S. News and World Report, Dec 24, 2019

Brendan Bures, "[As teen use rises, study finds vaping damages lungs,](#)" Chicago Tribune, Dec 19, 2019

University of Utah Health, "[NIH Grant Could Lead to Better Understanding of How Air Pollutants Aggravate Asthma in Children,](#)" Newswise, Dec 19, 2019

Davna Bose, "['It's killing children and no one is talking about it': Asthma is taking a steep toll on Newark's students and their schools,](#)" Chalkbeat, Dec 17, 2019

Lisa Sanders, "[A Runner Suddenly Developed Asthma. It Was Stranger Than It Seemed,](#)" The New York Times Magazine, Dec 12, 2019