



PediaNews

The Official Newsletter of the Student Society of
Pediatric Advocates

An Update on the FluMist

Written By: Paige Eber, PharmD Candidate 2018

FluMist®, the live attenuated influenza vaccine (LAIV), is no longer recommended for the 2016-2017 flu season.¹ On June 22, 2016, the CDC's Advisory Committee on Immunization Practice (ACIP) voted that FluMist®, known as the nasal spray influenza vaccine, is not to be recommended this year.² This was based on preliminary data about the effectiveness of LAIV in children two to seventeen years old during the 2015-2016 flu season. The data, made available from the U.S. Influenza Vaccine Effectiveness Network, showed an estimate of only a 3% vaccine effectiveness against the flu virus, meaning no protective benefit could be measured. This data is preceded by data from the 2013-14 and 2014-15 flu seasons that also showed poor effectiveness. For comparison, the effectiveness of the IIV (inactivated influenza vaccine, which is used in the commonly known flu shots) is around 63 percent in children of the same age range.



<https://www.flumistquadrivalent.com>

The reason for LAIV's poor results is not known. Flu shot effectiveness is based on many things, such as the accuracy of the viruses chosen to be in the vaccine for a given year compared to the flu virus strands actually circulating that year. Additionally, individual characteristics of the person being vaccinated versus others getting the same vaccine can have an effect. However, even though the effectiveness of the flu shot can vary from season to season, the 3% shown for the FluMist® is indicative of it not being an effective vaccine. The CDC states that recent studies have shown that the flu shot generally reduces the risk of

Volume V, Issue I

December 2016

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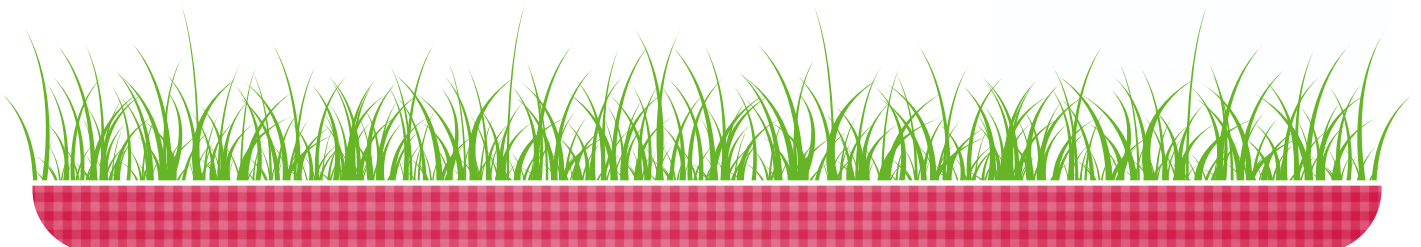
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An Update on the Flu Mist (cont.)

contracting the flu virus by 50-60% in each season that the circulating viruses have matched those in the vaccine provided.³

It is highly recommended by ACIP for children to get a yearly influenza vaccine once they reach the age of 6 months.¹ The flu hospitalizes thousands of people annually and has the potential to cause death from serious complications. Children, along with the elderly, are at an increased risk for contracting the influenza virus and 20,000 of those hospitalized every year are under the age of five. Chronic health issues, such as diabetes, asthma, or disorders of the brain or nervous system, can place children at an increased risk of having severe complications if they contract the flu. It is of even higher importance that children with these health problems get their flu shot annually. Those who come in close contact with these children, such as parents or other caregivers, also need to get their flu shot annually to prevent them from spreading the disease to children.⁴

The flu vaccine options available this year are the above-mentioned IIV and the recombinant influenza vaccine (RIV), both available in a shot form. If a child has never received a flu vaccination and they are between the ages of 6 months and 8 years old, they may have to get two doses of the flu vaccine. If a child has been vaccinated before, they only need the one dose every year. It takes the body about two weeks to produce the required antibodies that enable it to be protected against the flu virus. Therefore, it is recommended that they be vaccinated by the end of October to ensure they are protected from the beginning of the flu season.⁴ If you are still unsure of when to get your child vaccinated or how many doses they need to get, you can visit <http://www.cdc.gov/flu/protect/children.htm>. That site goes into detail regarding the timing and requirements for childhood flu vaccination.

Convincing a child to sit quietly while getting a shot is difficult. However, this is a great opportunity for parents to be a great role model and also get their shot at the same time. Many children are eager to allow their parents or siblings to go first and see how they react. The single most important thing that makes flu shots painful is when someone is tense or nervous and clinches their muscle during the shot. Therefore, preparing a child for the shot and helping them realize that it won't be as painful as they think it will be is really the key to making it pain free. Even though taking your child to get their shot is not going to be the most thrilling way to spend an afternoon, it is very important for children to get their flu shot every year. That one uncomfortable afternoon is a small compromise against the risk of your child possibly spending days in the hospital with a painful, life threatening illness. The CDC website can provide many useful and thorough answers for any other questions regarding the flu vaccine, including who should get vaccinated, when they should and why it is so important.

FluMist References

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Antihistamine Use in Children

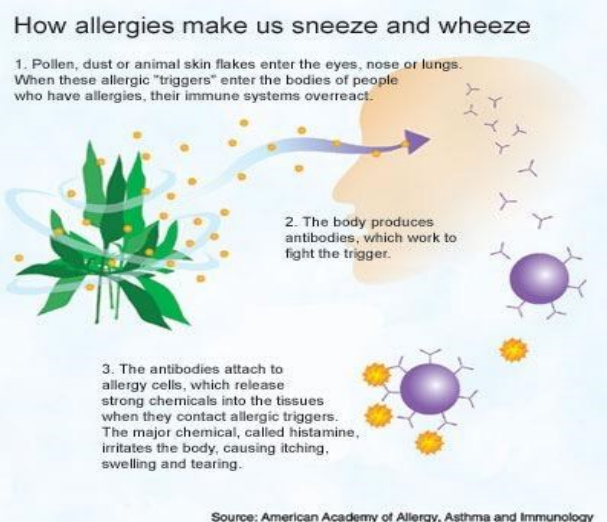
Written By: Rachel Bone, PharmD Candidate 2018

Runny noses, sneezing, and itchy, watery eyes are symptoms with which many parents are quite familiar. These symptoms can be signs of a common cold especially if accompanied by a fever, and will eventually clear on their own in the course of a week or two. Occasionally, the mucus-filled days seem to go on forever. In this case, it may not be a cold, rather seasonal allergies that is the culprit. According to the National Institute of Allergy and Infectious Disease (NIAID), up to 40% of children will suffer from allergic rhinitis, more commonly known as allergies or hay fever.¹ Although this group of symptoms are referred to as “seasonal” allergies, they can occur year-round. In the late spring and early summer, grass pollen causes sneezing, runny noses, and watery eyes, while leaf mold and ragweed are triggers in the fall. Fortunately for parents and the patients, there are a wide variety of options available to alleviate allergy symptoms.

For the child with a more mild case, there are several options to treat the symptoms of allergies, but not to prevent them. Unfortunately, options for children younger than two years of age are limited. While homeopathic options are available on the market for children as young as six months, the safety of these supplements should always be checked with a pharmacist. Non-pharmacologic options include lozenges, if the parent believes the child is old enough, to soothe sore throats. Humidifiers and eye drops are available to reduce dry, itchy eyes. There are also saline nasal sprays to help relieve congestion and runny noses. Nasal corticosteroids, such as triamcinolone acetone (Nasacort®) and fluticasone (Flonase®), are now available over-the-counter (OTC) and are typically reserved for more severe cases of hay fever in which the symptoms are severely debilitating, and where there is significant nasal congestion. To take care of symptoms at

the source, OTC antihistamines are widely available for both parents and child. Antihistamines are medications that work by blocking the binding site of the neurotransmitter histamine (H) on the H-1 and H-2 sites on effector cells. In seasonal allergies, there is a large release of histamine mediated by the formation of IgE antibodies in response to the allergen. There are a variety of effects on the body caused by the binding of histamine. Increased sensitivity of sensory nerves causes sneezing and itching. Increased vascular permeability and vasodilatation along with an increase in glandular secretions causes runny nose and watery eyes. Additionally, there is bronchoconstriction which can lead to wheezing. An increase in stomach acid can be seen which is mediated by histamine binding to the H-2 binding site within the stomach. As a histamine antagonist on the H-1 site, antihistamines effectively reduce the symptoms of allergies.²

There are several OTC options to help control children’s allergy symptoms. **Table 1** describes five of the most common options. All these medi-



American Academy of Allergy, Asthma, and Immunology
<https://www.aaaai.org/conditions-and-treatments/allergies>

Antihistamine Use in Children (cont.)

cations are H-1 receptor antagonists.³ The first-generation antihistamines are relatively nonspecific and have the ability to cross the blood-brain barrier.² Because of this, they can have significant central nervous system (CNS) effects, most distinctly sedative effects. The second-generation antihistamines are chemically altered so they cannot pass through the blood brain barrier thus reducing the occurrence of drowsiness and other CNS effects.² For children who need to take antihistamines during the day, the second generation medications may be beneficial due to their less significant sedative properties.

If the allergies are severe enough, the child may benefit from seeing an allergist and being evaluated for immunotherapy ("allergy shots"). Immunotherapy may decrease the chance that the allergic rhinitis may progress to allergic asthma, a known risk of children with a family history of allergic asthma and concurrent allergies. Immunotherapy also may reduce the number of flares in children with existing asthma.³

All three aforementioned second-generation antihistamines have been FDA approved for use in children starting at age six. Liquid formulations for these medications are approved for children as young as two years of age. Because the half-life of the second-generation antihistamines ranges between 8-14 hours, it allows for once daily dosing. Other precautions have been taken with the pediatric formulations of these medi-

cines to ensure their safety for all children. For example, Claritin® has made its formula lactose and gluten-free and available in liquid, chewable, and dissolvable tabs which are safe and easy for children to take. These medications should help alleviate allergy symptoms within a few days, and can also be used for the prophylaxis of allergic rhinitis if taken daily. For the treatment of allergic rhinitis, none of the mentioned medications are FDA approved for use in children under the age of two. With all these options available, no kid will miss too many days of play due to allergies.

Table 1: Available OTC Antihistamines

Generic Name	Brand Name	Significant Drowsiness?
1st Generation:		
Diphenhydramine	Benadryl	Yes
Chlorpheniramine	Chlor-Trimeton	Yes
2nd Generation:		
Loratadine	Claritin	No
Cetirizine	Zyrtec	No
Fexofenadine	Allegra	No

Antihistamine References:

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Should children receive probiotics to prevent antibiotic associated diarrhea in outpatient settings?

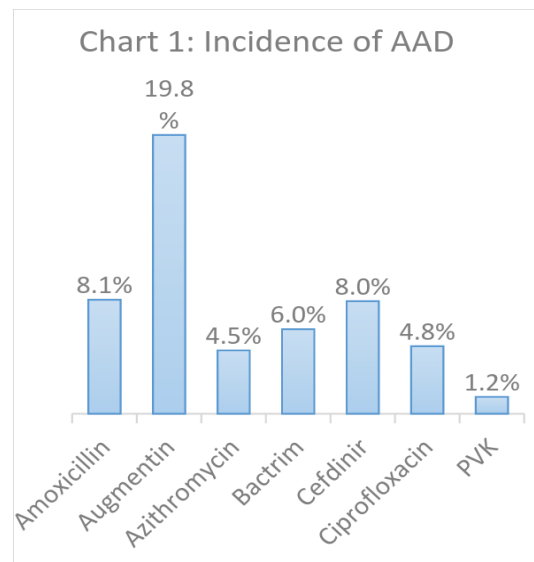
Written By: Zach Reuge, PharmD Candidate 2017; Edited by: Hilary Teibel, PharmD. and Haley Woods, PharmD Candidate 2017

Pediatricians prescribe antibiotics more often than any other drug class with an estimated rate of 28% per outpatient visit.^{1,2} Frequent antibiotic prescribing has led to a high incidence of antibiotic associated diarrhea (AAD).³ Consequences of AAD include poor compliance with medication and absence from school.⁴ Parents or physicians may supplement a child's diet with a probiotic to mitigate risk of AAD. With many varieties of probiotics available it is important to direct appropriate administration of the correct formulations.

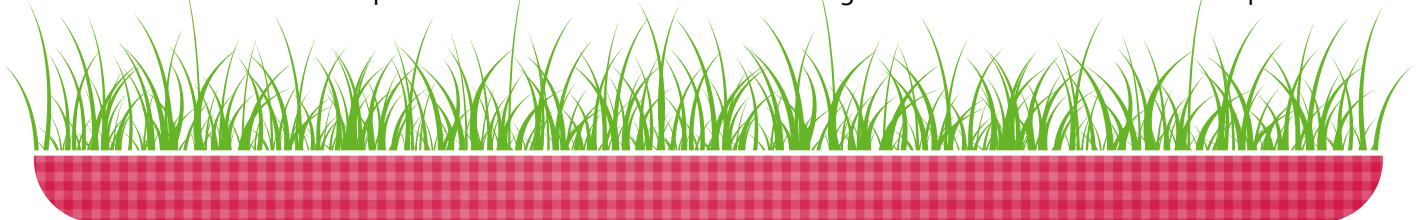
The human gastrointestinal tract contain bacteria essential for regulation of mucus production, tissue repair, and inflammation suppression. When antibiotic medications are administered to fight off infection, susceptible gut flora are diminished as well. Absence of commensal bacteria may lead to overgrowth of pathogenic bacteria, osmotic irregularity, and subsequent diarrhea.^{5,6} In 2003, a study of 650 children taking outpatient antibiotics and showed an 11% incidence of AAD.³ Each episode developed within an average of 5.3 days of antibiotic administration and diarrhea persisted for an average of 4 days. Notably, children were at greater risk of developing AAD if they were younger than 2 years old (relative risk: 1.81) or if the antibiotic prescribed was amoxicillin/clavulanate (RR:2.43). Frequently prescribed antibiotics and their risk of AAD are represented in **Chart 1**.

Probiotics contain bacteria or yeast cultures with potential to reestablish normal gut flora and prevent adherence of pathogenic bacteria to intestinal epithelium.⁷ These properties confer their ability to restore gastrointestinal health and prevent AAD. Benefits from probiotics are not uni-

versal because their effects are considered strain specific. A meta-analysis investigated the efficacy and safety of probiotics to prevent AAD in pediatric populations.⁸ *Lactobacillus GG* showed a relative risk of 0.3 (95% CI 0.15-0.6), corresponding with a number needed to treat (NNT) of 6. *Saccharomyces boulardii* showed a relative risk of 0.2 (95% CI 0.07-0.6), corresponding with a NNT of 8. Further, **Table 1** describes the administration and storage recommendations for these medications. As reflected in clinical trials, probiotics should be given during the full course of a child's antibiotic regimen.⁹ Immunosuppression is a contraindication because previous case reports describe probiotic related infections.¹



An IRB-approved survey was conducted via telephone and reached twenty-five Georgia area retail pharmacists. After receiving their verbal willingness to participate, each pharmacist was asked the survey questions reflected in **Table 2**. The findings can be found in **Chart 2** and empha-



Should children receive probiotics to prevent antibiotic associated diarrhea in outpatient settings? (cont.)

sized the need for educating pharmacists about probiotic benefits.

Some parents may prefer yogurt instead of probiotic medications because of affordability and presumed equivalent efficacy. Previous clinical trials report probiotic fortified yogurts lack convincing evidence for pediatric outpatient settings.^{12,13} Therefore, the brands represented in **Table 1** should be recommended with priority. Second, it is uncertain whether probiotics may shorten the duration of diarrhea once AAD has already developed. It is still reasonable to administer a probiotic as early as possible in this setting to promote gastrointestinal regularity. Lastly, parents may seek advice from a pharmacist regarding primary diarrheal symptoms; it is prudent to first advise rehydration as well as contacting a physician if the child is younger than 6 month or has lost greater than 9% of total body weight.

Table 1: Probiotic Products⁹⁻¹¹

Product	Bacteria	Administration	Storage
Culturelle Kids Packet ®	<i>Lactobacillus rhamnosus GG</i> (5x10 ⁹ CFU per packet)	Pour contents of packet into cool food or beverage and consume promptly. Administer one packet twice daily	Cool dry place away from sunlight
Culturelle Kids Chewable Tablet ®	<i>Lactobacillus rhamnosus GG</i> (5x10 ⁹ CFU per packet)	Chew one tablet twice daily	Cool dry place away from sunlight
Culturelle Digestive Health Capsules ® For children > 100 lbs	<i>Lactobacillus rhamnosus GG</i> (10x10 ⁹ CFU per packet)	Take one capsule twice daily	Cool dry place away from sunlight
FlorastorKids 250 mg packet®	<i>Saccharomyces boulardii</i>	Pour packet contents into cool beverage and consume promptly. Administer one packet twice daily	Refrigerate

Table 2: Survey Questions

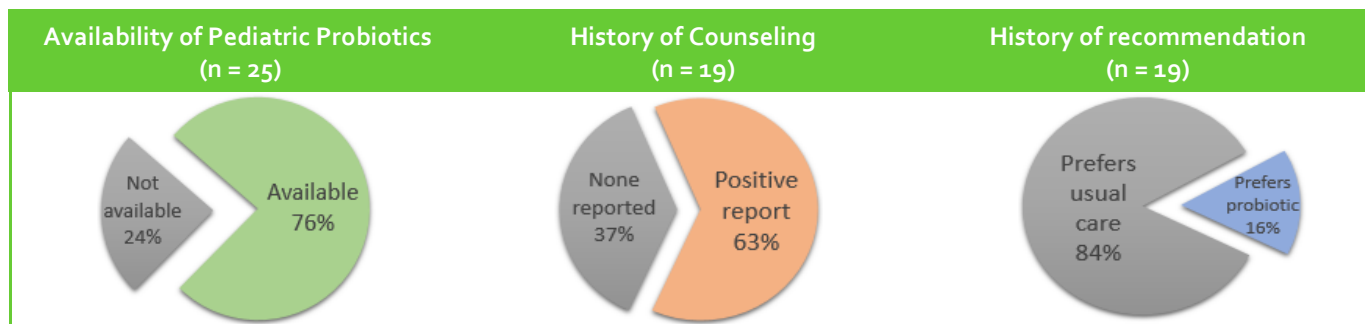
1. Do you carry probiotics for children in your pharmacy?
2. In the past year, have you counseled a parent regarding the administration of a probiotic to a child?*
3. When an antibiotic prescription is filled, do you recommend parents to supplement their child's diet with a probiotic to prevent antibiotic associated diarrhea?*

*Questions 2-3 were only asked when pharmacists reported available products



Should children receive probiotics to prevent antibiotic associated diarrhea in outpatient settings? (cont.)

Chart 2: Responses from Pharmacists



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Student Society of Pediatric Advocates

The Student Society of Pediatric Advocates is a student organization affiliated with the University of Georgia College of Pharmacy. We are a student group associated with the Pediatric Pharmacy Advocacy Group. The Mission of the SSPA is to bring awareness to the proper use of medication therapy in pediatric populations through various service and education-based initiatives. Service activities center around lending our medication-based knowledge to pediatric patients and their parents in our community. Educational activities are directed toward student members in an effort to safely and effectively extend pharmacy practice to pediatric populations by building relationships with mentors and professionals in the health care community, as well as supplementing didactic coursework with lectures by specialists and our peers. Overall, SSPA advocates for the safety and happiness of young patients while learning and having fun along the way. The purpose of our newsletter is to educate pharmacy students about pediatric pharmacy and advocate for pediatric patients within the University of Georgia College of Pharmacy.

