THE SECTION ON

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INFECTIOUS DISEASES

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Chair's Letter

Hello to everyone and I hope you are having a lovely spring. I recently had the opportunity to attend the AAP 2024 Advocacy Conference in Washington D.C. The conference is an annual event with the goal of helping pediatricians become more effective advocates. Over 300 pediatricians from across the country attended the event with the final day being our "trip to the Hill" where we met with Representatives and Senators from our state. It is a conference I recommend people attend.

I say "more effective" advocates because as pediatricians and infectious disease specialists, advocacy is part of our fiber. We are advocates for health and preventive medicine and having research conducted on drugs/vaccines used in children as we all know "kids are just little adults". We repeatedly are advocating for better health care for children, food programs (who can study if they are hungry?) and gun safety. These ALL are tremendously important actions and ones I encourage you to continue. A big take home message I had from the Advocacy Conference was to pick where you are going to spend your time and advocate for things for which you are passionate.

While I feel strongly about all the above issues I mentioned, I plan to focus my energy on an advocacy topic that may not be addressed as strongly as it could be; us! We sometimes forget that unless we take care of ourselves, it is impossible to provide the care and dedication our patients and families deserve. The number of people entering pediatric residency programs is falling.

According to the National Residency Matching Program (The MATCH), in Nov 2023, of the 77 fellowship positions in the US for Pediatric Infectious Disease offered, only 37 (48.1%) filled. This has been a continued downward trend since COVID. The article published in Pediatrics (Pediatr. 2024;153, Suppl 2:e2023063678N), postulated that the length of training, compensation, and public perception of Infectious Disease following the pandemic may have impacted applicant interest. During COVID, I remember thinking the pandemic will prove how important it is to have expertise in infectious diseases. I guess that is just another, of many, unexpected outcomes of COVID!

The decrease of people entering the subspecialty translates to an aging workforce. According to publication, the median age of PID sub-specialists is 49 years; 19.8% of whom are 61 to 70 years old! While 60 may be the new 40, the numbers tell us it is critical to act now if we are to remain a vibrant subspecialty. *Continued on Page 2*

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So, what can we do? Or, keeping with the theme; how best can we advocate for Infectious Diseases?
Here are a few thoughts that come to mind.

1. Early exposure to Pediatric Infectious Diseases.
    a. Have programs with high schools and colleges to introduce students to the importance of Pediatrics. (We have lots of cool science we can show them!)
    b. Have "Pediatric Clubs" at medical schools. Our ID Fellowship Director has regular meetings with our med students interested in Pediatrics and Infectious Diseases. We had 10 students at the last meeting. A solid start!
2. Plans for debt relief for Pediatric subspecialists.
    a. We all know the mounting debts faced by young pediatricians and how debt can shape the thinking of a specialty selected by medical students and residents. The American Academy of Pediatrics has been lobbying Congress to increase funding for the Pediatric Subspecialty Loan Repayment Program as well as tweak program requirements to make it easier for pediatric subspecialties to qualify. The program provides $100,000 in loan repayment for pediatric medical subspecialists, pediatric surgical specialists, and child mental health professionals who care for children in underserved areas. The first 112 awards were made last year. Your support can ensure the program thrives.
3. Re-think our fellowship training.
    a. Around the time I was a fellow (I won't tell you when that was!), Pediatric Infectious Disease fellowships were extended from two to three years. At that time, basic science research was common for infectious disease fellows to pursue. Thus, it was thought that a 3rd year of training was needed to help solidify research skills. Over the years, our subspecialty has changed and now many more fellowship graduates are pursuing Antibiotic Stewardship, Infection Prevention and Quality Improvement. These areas are critically important, however, it may be possible within two years to achieve the basic skills required for the positions.
    b. Thus, possibly we advocate for a two year fellowship with a 3rd year for those interested in gaining more experience in research.
4. Fix our compensation.
    a. In many pediatric departments, compensation (salary) is based in part on Relative Value Units (commonly known as RVUs). Routinely, Pediatric Subspecialists are compensated less than general pediatricians as well as our Internal Medicine Subspecialty colleagues. Let's advocate for RVUs to more accurately reflect our value!
    b. A lot of salary decisions are based on income generated by the provider. While Pediatric Infectious Disease Physicians do generate income, it is more important (or just as important) to focus on the cost savings we create for our institutions. Good infection prevention results in decreased nosocomial infections and shorter hospital stays. Good antimicrobial stewardship guides practitioners to lower cost with highly effective antibiotics, while reserving the higher cost drugs for patients without other options. Consultations by ID clinicians repeatedly have shown to decrease overall health costs. We need to educate our administrators on how a dollar saved is the same (or maybe better!) than a dollar earned.
    c. The publication in Pediatrics mentioned above stated that a survey in 2018 demonstrated that over the course of a practice lifetime, Pediatric Infectious Disease physicians make $1.6M less than community practice general pediatricians and $1.2M less than our Internal Medicine ID colleagues.
    d. The good news here is that things are changing. Many institutions are looking to make salaries in Pediatrics equivalent to the corresponding specialty in Internal Medicine. Also, at our institution, Pediatric Infectious Disease salaries are being made equivalent to our colleagues in Hospital Medicine.

Ok, I will get off the soapbox. But, as I said previously, this is my passion. I hope I may convince a few of you to join me in my goal of raising Pediatric Infectious Diseases to the level it deserves. I would love to hear from you about other ways we may help to advance Pediatric Infectious Diseases as well as what you have done to make the thought a reality.

Recognizing and Managing Patients Presenting with a Concern for Measles

John Flores, MD

Lilly Immergluck, MD

Scenario: A 7-month-old female with no significant past medical history presents to the emergency room for 2 days of fever, cough, facial rash, and red eyes. The patient is a refugee from South America who recently arrived at a local migrant shelter a few weeks prior. Per a recent report from the local department of public health, there has been an outbreak of the measles virus. *Continued on Page 3*

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The mother brought what appeared to be vaccination records from the country of origin, but the measles/mumps/rubella (MMR) or MMR-Varicella (MMRV) did not appear on the card. As the patient is being admitted, questions arise regarding the likelihood of measles infection, potential treatment options, and additional quarantine or isolation measures for those who have recently come in contact with the patient.

The goal of this article is to give a brief historical background on measles, the pathophysiology of the disease, epidemiology in the United States (US), and answer these questions posed by the example case, so as to improve the practice of our readers.

Discovered in 1757, measles became a nationally notifiable disease in 1912, when an estimated 6,000 related deaths were reported annually. Measles, also known as rubeola, is caused by *Measles morbillivirus* (genus *Morbillivirus*, family Paramyxoviridae and subfamily Orthoparamyxovirinae). Attack rates in susceptible patients may reach as high as 90% in close-contact settings, giving rise to the basic reproductive number of 12-18 (R^0). Measles is highly communicable, and herd immunity is achieved only if population immunity is 95% or greater. Seasonal peak incidence of infection tends to occur in late winter and spring. Before the introduction of the measles vaccine in 1963, most infections occurred in preschool and elementary school-aged children.

Once vaccination became routine, infants, unvaccinated, or immunocompromised children made up the majority of infected patients. From the licensure of the measles vaccine in 1963 until 2000, the number of measles cases steadily declined in the US, leading to the 2000 announcement that measles had been eradicated. Globally, by the end of 2018, 89% of children had received at least one dose of the combined measles-mumps-rubella (MMR) vaccine by their 2nd birthday. From 2000-2016, it is estimated that measles vaccinations prevented an estimated 25.5 million deaths. However, between 2016 and 2019, new cases worldwide rose by 556% to almost 870,000, with approximately 207,500 deaths. Since 2019, the COVID-19 pandemic has negatively impacted public health vaccination efforts, including surveillance systems to monitor vaccine-preventable conditions, including measles. In 2019, there were 22 outbreaks (1,274 reported cases) in the US alone. Additionally, from November 2023 through March 2024, the Centers for Disease Control and Prevention (CDC) reported 64 total cases across 17 states. The most recent resurgence of measles infections has also been fueled by under-immunized and close-knit communities. mass migration of unvaccinated immigrants and refugees, rising vaccine hesitancy, and vaccine misinformation/disinformation.

Today, measles continues to occur in high enough numbers to necessitate that healthcare professionals must recognize signs and symptoms and have in place safe and efficient measures to diagnose and manage those patients pending verification of diagnosis. Moreover, healthcare systems must develop appropriate treatment strategies, while implementing prevention measures, including efforts to increase vaccination among susceptible populations.

Acute measles infection can present with a variety of signs and symptoms: early disease includes cough, coryza (catarrhal inflammation of the mucous membrane in the nose), fever, and conjunctivitis, followed by a diffuse maculopapular rash that begins on the face, then trunk, and lastly extremities. Pathognomonic of measles, Koplik spots (small white spots, often with red edges, on the buccal mucosa) can also be found. The incubation period is 8-12 days (range of 7-21 days). Peak transmissibility generally occurs from 4 days before to 4 days after rash onset. Acute otitis media, pneumonia, gastroenteritis, and acute meningoencephalitis can also be secondary complications. The majority of fatal cases are from pulmonary and neurologic complications, which occur in 1-3 per 1000 cases. Risk factors for severe illness include young age (< 5 years old), pregnancy, immunocompromised conditions, and severe malnutrition including vitamin A deficiency.

Although rare, devastating manifestations include measles inclusion body encephalitis (MIBE) and subacute sclerosing panencephalitis (SSPE). MIBE, a clinical diagnosis confirmed only with brain biopsy showing intranuclear inclusion bodies, occurs predominantly in immunocompromised patients, primarily within one year of infection. The usual presentation is subacute, with evidence of progressive peripheral and central neurologic dysfunction, including focal and generalized seizures, global weakness and neuropathy, cognitive dysfunction, and altered mentation. SSPE, a degenerative disease of the central nervous system, initially manifests with behavioral abnormalities and progressive cognitive decline over 6 to 11 years after initial measles infection. Patients acquire permanent motor and autonomic dysfunctions, often losing the ability to ambulate, developing breathing difficulties and cardiovascular morbidity, with death usually ensuing as a complication of secondary infections or heart failure.

Diagnosis is often based on recognizing the constellation of fever, cough, coryza, and rash with or without Koplik spots. Since other viruses (e.g., adenoviruses, herpesviruses, enteroviruses) may present similarly, laboratory-based tests are needed to confirm the diagnosis. Tests include identifying presence of IgM or IgG antibodies, and real time polymerase chain reaction (RT- PCR) which may detect measles RNA from bodily fluid specimens collected within the first 7 days from rash onset. *Continued on Page 4*

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Currently, no antiviral agent is approved by the Food & Drug Administration (FDA) to treat measles. *In vitro* studies have shown efficacy with ribavirin, but with clinical trial data lacking it is only used for severely infected or immunocompromised patients. Supplemental vitamin A for 2 days improves clinical outcomes and decreases mortality in resource-limited settings. The World Health Organization established guidelines for vitamin A treatment in all infected children (**Table 1**), with a 3rd age-specific dose recommended 2-6 weeks later for vitamin A deficient children.

The CDC and the American Academy of Pediatrics (AAP) recently collaborated through Project First Line to create a one-page guide with updated guidance in terms of diagnosis, isolation, and subsequent management of patients who are at risk or are being considered infected with measles. (ThinkMeasles) For patients hospitalized with measles, along with standard precautions for infection control, precautions to prevent airborne transmission should be in place from the onset of rash for 4 days in immunocompetent patients and for the entire hospitalization in immunocompromised patients. Other hospitalized patients exposed to measles who are susceptible should be placed on airborne precautions from 5 days after exposure until 21 days after the last contact with the index case.

Routine vaccination is ultimately the most important intervention to prevent the acquisition and transmission of measles: the 1st dose of either measles-mumps-rubella (MMR) or measles-mumps-rubella-varicella (MMRV) vaccine should be given at 12-15 months of age, and a 2nd dose between 4-6 years of age or at least 28 days after the 1st dose. Reported, but rare, side effects of MMR/ MMRV vaccines include transient fever, rash, thrombocytopenia, and allergic reactions. MMRV has a higher rate of febrile seizures than MMR and should not be given to patients infected with HIV as the vaccine has not been clinically studied in this population.

For people exposed to measles, certain predisposing conditions (e.g., unvaccinated or without documented measles immunity; underlying primary or secondary immunocompromised; pregnancy) qualify them for post-exposure treatment with vaccine and/or immune globulin (IG) (**Table 2**). Post-exposure vaccination is most beneficial when administered within 72 hours of exposure, and IG within 6 days of exposure.

In the setting of a measles outbreak or travel to countries with significant rates of endemic measles, infants 6-11 months of age should receive a dose of MMR/MMRV, recognizing that this dose does not count towards the recommended 2-dose series that is initiated at 12-15 months. In the scenario presented, this patient did receive the recommended doses of MMR after she was quarantined and provided the supportive care necessary.

In unvaccinated children, MMR/MMRV should be given at least 2 weeks before administration of a blood product or intravenous immune globulin (IVIG) to avoid the risk of neutralizing the vaccine virus with the administered passive antibodies. Likewise, children treated with IVIG or corticosteroids should wait the recommended number of months before receiving MMR/MMRV (at least 4 weeks and up to 11 months depending on the dose of IVIG or steroid).

Sustained global vaccination programs against measles have spared millions of infants and children from infection with this potentially deadly virus. However, increased vaccine hesitancy, global migration trends, and disruption of public health interventions in the setting of the recent COVID-19 pandemic have led to pockets of resurgence of what is a dangerous but vaccine-preventable disease, and the risk is real for further outbreaks. With this, it becomes much more vital that healthcare professionals can identify, manage, and prevent the spread of this potentially devastating virus.

Table 1. Recommendations for Vitamin A Administration

Age	Dose
≥12 months of age	200,000 IU (60,000 µg RAE)
6 – 11 months of age	100,000 IU, (30,000 µg RAE)
<6 months	50,000 IU (15,000 µg RAE)

IU = international units, RAE = retinol activity equivalent

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Table 2. Post-exposure Prophylaxis (PEP) for Measles

Patient Category	Age	Status of Measles Immunity	Time from Exposure to Measles (days)		
			≤3 days from exposure	**4 – 6 days from exposure**	**>6 days from exposure**
Non-pregnant, Immunocompetent	All ages	Yes	PEP not indicated: exposed person has documented immunity.		
	< 6 months	No, due to age prior to vaccination	IMIG*		PEP not indicated**^
	6-11 months	No, due to age prior to vaccination	MMR vaccine, no quarantine needed	IMIG*	PEP not indicated**^
	≥ 12 months	No, zero vaccine doses, or negative IgG	MMR vaccine, no quarantine needed	PEP not indicated**^, then give MMR to protect from future exposures after 21-day quarantine	
	≥ 12 months	Partial immunity, history of 1 dose of MMR vaccine	2nd dose of MMR vaccine if ≥ 28 days or after last dose, no quarantine needed	Household member should obtain IgG to determine immunity, and serum Measles PCR if able, and home quarantine while awaiting results; if IgG negative then quarantine for 21 days after last exposure	
				Non-household members: • 1-3 years: less likely sick due to proximity of 1st MMR vaccine dose • ≥ 4 years: give 1 dose of MMR vaccine	
	Adults	Unknown	MMR vaccine, no quarantine required	Household members, or those non-household members who work in settings with children (daycare, school, etc.) or in a health care facility, should obtain IgG, and serum Measles PCR if able, to determine immunity, home quarantine while awaiting results; if IgG negative then quarantine for 21 days after last exposure	
				Non-household members of a confirmed/suspected case who do not work in setting with children (daycare, school, etc.) or healthcare facility may collect antibody titer, and serum Measles PCR if able, while in clinic/hospital or reach out to their own provider in timely manner	
Severely Immuno-compromised***	< 12 months	Not applicable	IMIG*		PEP not indicated**^
	≥ 12 months		IVIG*		
Pregnant	All ages	Yes	PEP not indicated		
		No	IVIG*		PEP not indicated**^
		Unknown	Draw antibody titers, and serum Measles PCR if able, STAT to determine immunity and proceed per above		PEP not indicated**^

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Immune = IgG positive, 2 MMR or MMRV doses, or born before 1957. *Home quarantine for 28 days after last exposure. **Home quarantine for 21 days after last exposure. ^PEP too late to be given. ***Severe primary immunodeficiency includes: bone marrow transplant within 1 year of immunosuppressant therapy, receiving treatment for acute lymphoblastic leukemia (ALL) up until 6 months after last treatment dose, solid organ transplantation recipients on immunosuppressants, receiving daily corticosteroid therapy with a dose ≥20 mg (or >2 mg/kg/day for patients who weigh <10 kg) of prednisone or equivalent for ≥14 days, receiving certain biologic immune modulators, such as tumor necrosis factor-alpha (TNF-α) blockers or rituximab, AIDS or HIV with severe immunosuppression defined as CD4 <15% (all ages) or CD4 count <200 lymphocytes/mm^3 (age >5 years).

References

Contagious Inequities: Unraveling Health Disparities in Infectious Diseases

Melissa E. Day, MD, FAAP and Jonathan Mannheim, MD, FAAP

Health disparities in pediatric subspecialties are beginning to be examined, and pediatric infectious disease is no exception.

The COVID-19 pandemic emphasized how inequities based on race and socioeconomic status impact the risk of infection and infection-related outcomes in children. Following is an overview of key areas of health disparities in the field of pediatric infectious disease and their potential impacts on children.

Vaccine uptake and hesitancy

Unequal receipt of childhood vaccines along racial, ethnic and socioeconomic lines results from both inequitable distribution of vaccines as well as differing rates of vaccine hesitancy.

Broadly, families with lower household incomes have an increased likelihood of never vaccinating their children (Ellithorpe ME, et al. *Matern Child Health J*. 2022;26:280-288). To improve vaccination rates in children in the lower socioeconomic strata, the U.S. government established the Vaccines for Children (VFC) program in 1993. Since its creation, disparities in uptake of diphtheria, tetanus and acellular pertussis (DTaP) and measles-mumps-rubella (MMR) vaccines have decreased between children of Black or Hispanic descent relative to white children. The VFC program, however, did not reduce disparities along socioeconomic lines (Walsh B, et al. *Health Aff (Millwood)*. 2016;35:356-364).

Disparities also have been seen in uptake of the human papillomavirus (HPV) vaccine.

Multiple studies have demonstrated that rates of HPV infection and resultant cervical cancers are disproportionately higher among women in lower socioeconomic brackets or those of minority descent.

While Black and Latina adolescent women, as well as women in lower socioeconomic brackets, initiate HPV vaccination at equal or even higher rates than higher-income and/or white adolescent females, their rates of completing the series lags behind those of adolescent white and/or higher-income women (Jeudin P, et al. *Clin Ther*. 2014;36:24-37). Reasons for not completing the HPV series include lack of knowledge about subsequent doses and difficulty finding time for appointments.

Numerous studies have shown that provider recommendations heavily influence parental decision-making regarding vaccination. A strong recommendation from a health care provider regarding the importance of HPV vaccination resulted in 90% of the teens completing the series (Kester LM, et al. *Matern Child Health J*. 2013;17:879-885; Mehta NR, et al. *Obstet Gynecol*. 2012;119:575-581). *Continued on Page 7*

Contagious Inequities

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Vaccine hesitancy casts a pall on receiving routine childhood immunizations. Numerous studies have shown disparities in rates of hesitancy across racial, ethnic and socioeconomic lines. A recent study showed that the highest rates of vaccine hesitancy (for DTaP, MMR, rotavirus and combined seven-series vaccination) were among parents of children who are Black (37%) or Hispanic (30.1%), as well as among mothers with a high school education or less (31.9%) and families living below the poverty line (35.6%) (Nguyen KH, et al. *Am J Prev Med*. 2022;62:367-376). The rate of hesitancy was 16.4% in white counterparts, 26.6% in those who had attended some college and 13% in those with education beyond a bachelor's degree.

Antibiotic prescribing

Racial, ethnic and socioeconomic factors contribute to antibiotic prescribing inequities in the U.S. Even when accounting for a child's age, gender and insurance status, providers are less likely to prescribe antibiotics for Black children compared to non-Hispanic white children (Gerber JS, et al. *Pediatrics*. 2013;131:677-684).

In the urgent care setting, discrepancies in appropriate antibiotic prescribing are present across race. For unclear reasons, non-Hispanic Black children and Hispanic children are much more likely than non-Hispanic white children to be prescribed antibiotics according to practice guidelines (Nedved AC, et al. *Infect Control Hosp Epidemiol*. 2023;44:2009-2016).

Research is exploring key drivers of these inequities, including neighborhood-level socioeconomic deprivation. One such metric is the childhood opportunity index (COI), which examines opportunities available to children based on where they live.

A study in Kentucky and Indiana showed that those from low- and moderate-opportunity neighborhoods tended to have higher antibiotic prescribing compared to very high-opportunity neighborhoods (Wattles BA, et al. *J Pediatr*. 2023;261:113572). These differences were present even when accounting for race and insurance status. More research is needed on a national scale to evaluate the impact of neighborhood-level opportunity and socioeconomic deprivation on antibiotic prescribing practices.

A recent review (Kim C, et al. *Open Forum Infect Dis*. 2023;10:440) highlights the scope of factors involved in inequitable antibiotic prescribing at the national, community, health care and individual levels.

National factors included national/state policies combating antimicrobial resistance and affecting access to health insurance, as well as structural inequities and historical context of discriminatory treatment of particular groups. Community factors included cultural norms/beliefs, geography and access to resources. Health care factors included clinical setting, access and workforce diversity. Individual factors included patient and caregiver demographics (such as health literacy, age and race), clinician experience level and the clinical interaction (including patient interactions, implicit bias and power dynamics).

Nirsevimab rollout

In August 2023, the Centers for Disease Control and Prevention recommended all children under 8 months entering their first respiratory syncytial virus (RSV) season be administered nirsevimab, a long-acting monoclonal antibody to help prevent RSV infections. A recent editorial highlighted challenges in equitable access to nirsevimab (Yang YT, Schaffer DeRoo S. *J Public Health Manag Pract*. 2024;30:153-154).

With nirsevimab's access limited to pediatric clinics, families who reside far from a clinic could have difficulties accessing this therapy due to distance, transportation and required time away from work. Although the VFC program can cover the $495 cost of a dose of nirsevimab, this may not be available universally, placing a financial burden on families with limited means. Additionally, increasing awareness and education of this therapy and addressing medical mistrust in vulnerable populations, such as Native American communities, is key to help those who may be at higher risk for poor outcomes from RSV. As the winter respiratory virus season begins, lessons from the nirsevimab rollout can improve equitable access and uptake of this therapy.

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Travelers' Diarrhea – just when you thought you knew what was safe – it's not necessarily so

Christopher J. Harrison, MD, FAAP, FPIDS

Tell me if you heard this one. Soon after tourists buy burritos from a street vender, they develop abdominal cramping and multiple loose to watery stools that, for several days, limiting their vacation to the closest bathroom.

Is your first thought – if they had been more careful about what they ate/drank, they would not have gotten traveler's diarrhea (TD)? Well, not so fast my friend. Turns out, nearly half of TD cases are due to environmental exposures – not something a person ate or drank. Scary, isn't it?

An estimated 10-40% of travelers develop TD. The underlying pathogenesis involves damage to the gut mucosa with increased secretion and/or decreased absorption of intestinal fluids/electrolytes. The damage can be by direct epithelial infection/invasion or by indirect toxin-mediated effects (e.g. from *V. cholerae*, or from Enterotoxigenic *E. coli* (ETEC)'s heat-labile enterotoxin (LT) and/or heat-stable enterotoxin (ST).

Pathogens: The most commonly accepted cause of TD is ETEC. But the best known to pediatric care providers may be Norovirus and Rotavirus (both usually add notable vomiting to the presentation). However, viruses likely constitute only ~10% of TD, even when adding in astrovirus and enteric adenovirus. Non-ETEC bacterial etiologies include what I call the other "EC" brothers [Enteroaggregative *E. coli* (EAEC), Enteroinvasive *E. coli* (EIEC), Diffusely Adherent *E. coli* (DAEC)], and Shiga toxin–producing *E. coli* (STEC)], as well as *Yersinia enterocolitica*, *Salmonella*, *Shigella*, and *Campylobacter spp*. Less often causes include *Aeromonas hydrophilia*, *Plesiomonas shigelloides*, *Arcobacter spp.*, and *Vibrio parahaemolyticus*. Finally, parasites (*Giardia spp.*, *Entamoeba histolytica*, *Cyclospora cayetanensis*, *Dientamoeba fragilis*, *Isospora belli*, *Cryptosporidium parvum*, and *Microsporidium spp*.) cause a small proportion of TD, but symptom onset is usually 2-4 weeks later (cyclospora is the exception – sudden onset within days). Giardia seems the most frequent TD parasite and is often environmentally acquired by a water source.

The incubation is shortest for toxin mediated TD (within hours) whereas *Campylobacter*'s is 3-10 days vs. 2-4 weeks for most parasites. Clinically, TD most commonly presents as crampy watery diarrhea with few if any systemic symptoms. The most common causes of dysentery-level TD are *Shigella*, *Campylobacter* and *Yersinia* and systemic symptoms including high fever are usually present.

Resources: So, what should we advise families to do when traveling to minimize chances of TD? Review pertinent information, e.g., online travel-related web-pages from the CDC. (1, 2) They have a wealth of information and concise tables that provide severity definitions and tips for prevention and management. Another good resource is the 2018 Guidelines for Travelers Diarrhea. (3) And then there is the old standby, the SOID Red Book, pages 327-328.

The Overall Battle Plan: It is essential to counsel families before travel. Consider giving a copy of the most informative tables from the above references to the family to take with them. Regardless, review and update routine vaccinations and give enteric vaccines when indicated. Then help them understand how to identify TD and dysentery. Also remind them of the classic behavioral prevention strategies (despite being only partially effective). Furthermore, families need to know that they can self-manage most episodes with the appropriate choice of management (oral rehydration and/or self-treatment with antimicrobials and/or over the counter (OTC) remedies) based on severity. Table 1. Prescribe a reasonable supply of recommended antibiotics and remind parents that most children are not treated with antibiotics, but management focuses on maintaining hydration. Finally share red flags indicating the need for professional care (dehydration, persistent high fever, lethargy, failure to respond to initial management of severe TD).

Definition: TD in adults is usually defined as ≥ 3unformed stools /day with ≥ 1 of the following: fever, nausea, vomiting, cramping/urgency, or stool blood/mucus. In children, the stool count differs- ≥ 2-fold increase in the frequency of unformed stool (stool would assume shape of container). *Continued on Page 9*

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TD severity – not frequency based - Guidelines for Traveler's Diarrhea (Riddel et al 2017):

- Mild (acute) - tolerable diarrhea, no distress, not limiting planned activities
- Moderate (acute) - distressing diarrhea, or limits planned activities
- Severe (acute) - incapacitating diarrhea, or completely prevents planned activities
- Dysentery - gross blood admixed with stools (not just streaks) - always severe
- Persistent - diarrhea lasting ≥ 2 weeks

Behavioral Preventatives: We should advise care in choosing sources for drinks and food, and how they are prepared, e.g., the classic "no ice" precaution. Fastidious personal hygiene includes judicious use of degermer preps where soap and water are not immediately available and particularly when touching potential environmental sources of TD pathogens. (3) One environmental source to focus on is bathrooms, even those in multi-star hotels or Airbnb-like rentals. Use of pasteurized dairy products, bottled water or prepackaged sodas or juices are preferred. Shellfish, buffets, fresh fruits /vegetables, dressings, and street vendor foods are no-no's. Note: Children's risk for TD increases if they are visiting friends and family during travel.

Prophylaxis: Bismuth subsalicylate (BSS) can reduce TD rates by ~50%. However, the number of tablets required and the inconvenient dosing, makes BSS use as TD prophylaxis difficult and limits its use. Further, The Yellow Book states that BSS is not recommended for <3 year olds or pregnant people, and generally not for <12 year olds. All that said, some clinicians use BSS off-label, but remember some viral infections, e.g., influenza, varicella, increase risk for Reye's syndrome. BSS adverse effects include: common - tongue/stool blackening; and less common - constipation, nausea; rare tinnitus. Aspirin allergy, gout, or renal insufficiency, and concurrent anticoagulants, methotrexate, or probenecid are contraindications for BSS. BSS plus aspirin use can increase salicylate toxicity risk.

Probiotics: Data are insufficient to recommend probiotic use to prevent TD, but some families routinely give probiotics to their children. In such instances data are also insufficient to recommend against probiotic use while travelling.

OTC (over the counter) bovine colostrum products (oral) with each meal: The Yellow Book states: "Commercially sold preparations of bovine colostrum marketed as dietary supplements are not approved by the US Food and Drug Administration (FDA). Because no data from rigorous clinical trials demonstrate efficacy, insufficient information is available to recommend the use of bovine colostrum to prevent TD". However, one product is currently in Phase 2 trials with the objective to obtain FDA approval for TD and preliminary data indicate ~60% reduction in TD.

Prophylactic Antimicrobials: - Not recommended for most travelers, despite 30-year-old controlled data that antibiotics reduce diarrhea attack rates by 90%. For most, the benefits are not greater than the risks. First, antibacterials do not protect against the 15-20% of TD caused by viruses or parasites. Second, extended-spectrum β-lactamase-producing Enterobacteriaceae (ESBL-PE) colonization risk is somewhat increased by antibiotic use during international travel. Also, treatment options for breakthrough TD become very limited. Nevertheless, prophylactic antibiotics might rarely be considered, e.g., for short-term high-risk travelers who are immunocompromised or who have notable medical comorbidities.

Management: Diet: Continue breastfeeding on demand or formula feeding for infants. Otherwise, a regular diet is recommended.

Treatment: Infants and younger children with TD are at greater risk for dehydration, which is best prevented by the early initiation of oral rehydration. Thus, the main treatment for TD in children, particularly those <6 years old, is oral rehydration with oral rehydration solution (ORS) or similar liquids. But, per the Yellow Book, empiric antibiotics can be used for severe TD or dysentery; azithromycin is first line. Quinolones are not routinely recommended for children <12 years old.

In adults, empiric self-initiated antibiotics are options even with moderate TD. Table 1. Azithromycin or quinolones are routine first line choices. Rifaximin is the second-line drug for those ≥ 12 years old and not able to take first line drugs. *Continued on Page 10*

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Antimotility agents: Symptomatic relief from synthetic opiates (usually loperamide) can allow a return to planned activities and/or travel back to home. Antibiotics plus loperamide are safe, even with invasive pathogens. Of note, ESBL-PE colonization might be more common with the combination. Loperamide alone for febrile TD patients is not recommended. Loperamide liquid is available for children, but not used frequently in preschool aged children in the real world.

Symptoms after returning home. Returning travelers with severe or persistent symptoms or those who fail empiric therapy should receive microbiologic stool testing. Molecular testing panels that include multiple clinically relevant pathogens are best if a quick answer is needed or standard testing is unrevealing. That said, data are lacking to show that multiplex molecular testing improves outcomes. If a bacterial or parasite cause is found, treatment should be targeted to the detected pathogen, using antibiotic susceptibilities to inform choices for bacterial causes. One less frequently recognized issue is post-infectious new onset irritable bowel syndrome (PI-IBS) or functional bowel disease (PI-FBD). Consider a gastroenterology consult to evaluate for these if all microbial testing is negative, but symptoms persist. Note however that these two conditions appear more frequent in adults.

Table 1. Empiric Treatment Options for Adults or >= 12-Year-olds with Traveler's Diarrhea (TD) Riddel et al 2017.

1. MILD TD

Antibiotic treatment **not** recommended
Consider treatment with bismuth subsalicylate or loperamide

2. MODERATE TD

Antibiotics an option
- 1st line - Azithromycin
- 2nd line - Fluoroquinolones
- Alternate 2nd line - Rifaximin

Antimotility drugs
- Loperamide an option as monotherapy or adjunct to antimicrobial

3. SEVERE TD

Antibiotics advised (single-dose regimens may be used)
- 1st line - Azithromycin
- 2nd line - Fluoroquinolones or rifaximin[1] for severe, non-dysenteric diarrhea

Antimotility drugs
- Loperamide an option as adjunct to antimicrobial- **BUT**
- Monotherapy **not** for patients with bloody diarrhea or diarrhea plus fever

[1]Recommendations released prior to US approval of rifamycin SV, which is in same class as rifaximin with the same mechanism of action, so rifamycin SV is a reasonable alternative to rifaximin

References

Call for SOID Fellows

Call for Nominations
Section on Infectious Diseases (SOID)
Executive Committee Training Fellow Liaison

The mission of the Section on Infectious Diseases is to improve the care of fetuses, newborns, infants, children, adolescents, and young adults with infectious conditions and to promote the prevention of these diseases through educating trainees, disseminating knowledge of pediatric infectious diseases, promoting quality, and supporting research in infectious diseases. *Continued on Page 11*

Call for SOID Fellows

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The SOID Executive Committee is committed to engaging ID training fellows in leadership opportunities.

At this time, the SOID Executive Committee invites all first- or second-year ID fellowship trainees interested in serving a two-year term as an SOID Executive Committee Training Fellow Liaison (beginning July 31, 2024) to submit their nomination. Required nomination materials include a letter of interest, curriculum vitae, and letter of recommendation. Nomination materials are due to Jorie Ouimet, Senior Manager, Immunization Initiatives and Staff to the SOID at Jouimet@aap.org by **July 19, 2024**. Please see the position description with eligibility criteria below.

POSITION DESCRIPTION & ELIGIBILITY CRITERIA

Responsibilities:

- **Collaborate** with the SOID Education Subcommittee. This committee was established to assist the Executive Committee and the Program Chair in the development of infectious diseases educational programming for general pediatricians and infectious diseases physicians. Activities of the Subcommittee are directed by the Program Chair. The liaison should:
- Annually **work** with the Program Chair to identify topics for the general ID sessions at the AAP National Conference and Exhibition.
- Periodically **assess** the satisfaction of SOID members with the current educational programming available.
- **Identify** the educational needs/gaps of SOID members using a variety of mechanisms, such as, but not limited to, surveys, new policy, collaboration with other AAP groups, and changes in the external environment, such as the occurrence of an ID related outbreak.
- **Develop** educational programming that:
    - Uses a variety of formats including online (Pedialink), the SOID website and newsletter, *AAP News*, and continuing medical education (CME) and Board prep courses.
    - Reflects the needs the SOID membership: general pediatricians, infectious diseases physicians, ID fellows in training, residents, and medical students.
    - Considers CME and maintenance of certification needs/requirements.
- **Attend** two in-person SOID Executive Committee meetings per year held in the fall and spring,* and participate in conference calls as necessary.

Term:

Up to two years, July 31, 2024 and ending June 30, 2026. Preference will be given to those able to serve the full two years.

Eligibility:

- Current enrollment in an accredited Pediatric Infectious Diseases Fellowship (Post Residency) Training Program
- Member of the American Academy of Pediatrics (may join at the time of application)
- Member of the Section on Infectious Diseases (Note: ID training fellows who are currently AAP members do not pay additional dues to join the Section)

Voting Status:

This is a voting position

Appointment:

Appointed by the SOID Executive Committee

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Call for SOID Fellows

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Materials Required from Nominees Considered by Executive Committee:

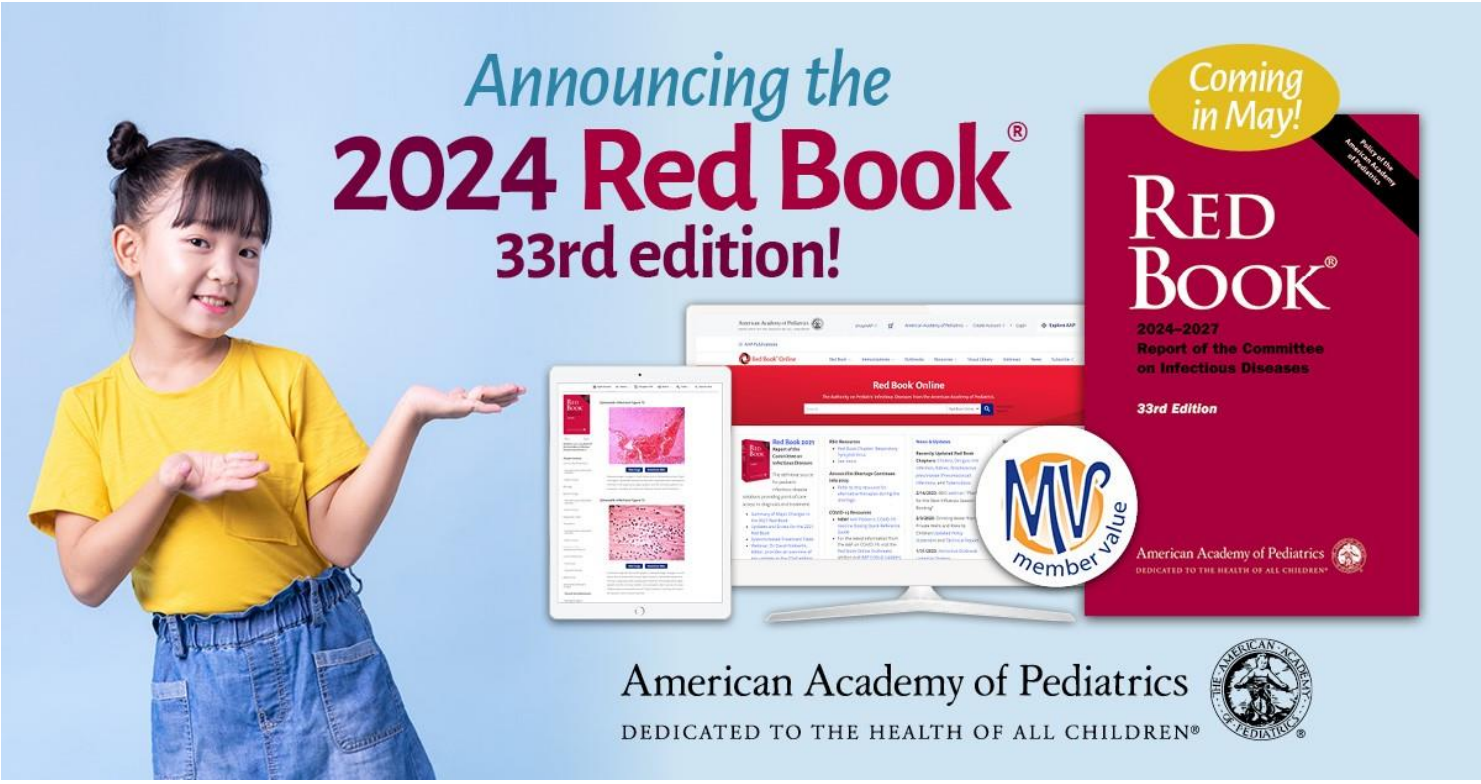
- Letter of interest from the nominee
- Curriculum vitae from the nominee
- Recommendation letter from the nominee's Training Program Director

Examples of Training Fellow Liaison Accomplishments/Projects in Process:

- Planning educational sessions for the AAP National Conference
- Writing articles for the *AAP News* Focus on Subspecialties column and SOID newsletter
- Participating in the technical review of draft policy statements/clinical and technical reports and articles for parents on infectious diseases related topics for AAP HealthyChildren.org
- Attending advocacy training sponsored by the AAP
- Participating in the development of on-line CME courses (ie, pertussis, vaccine hesitancy, *C- difficile*, emerging infections andtick-borne infections)

*SOID meetings are typically held in conjunction with the AAP National Conference and Exhibition in the fall and at Academy headquarters in the spring. Expenses for meeting attendance will be covered by the Section and includes airfare (secured through the Academy Travel office), one day's expenses related to hotel, meals, and ground transportation.
Registration for the AAP National Conference is also covered.

NEW! 2024 Red Book on Red Book Online!



The new 33rd edition of *Red Book: 2024 Report of the Committee on Infectious Diseases* is on *Red Book Online* (RBO)—an AAP Member Benefit! In this new edition, you will find the latest clinical guidance on the manifestations, etiology, epidemiology, diagnosis, and treatment of more than 200 childhood infectious diseases, as well as the latest information about vaccines, emerging novel diseases, diagnostic modalities, and treatment recommendations from the combined expertise of the American Academy of Pediatrics (AAP), Centers for Disease Control and Prevention (CDC), US Food and Drug Administration, (FDA), and National Institutes of Health (NIH), and hundreds of physician contributors. *Red Book* guidance spans far beyond the pediatric practice to include family medicine, emergency medicine, public health, school health, and other medical specialties.

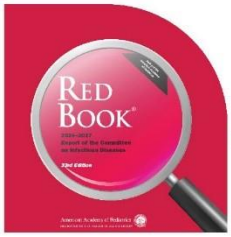
New to this new edition:

- All chapters were assessed for relevance in the dynamic environment that is the practice of pediatric medicine today, and every chapter has been modified since the last edition.
- The chapter "Discussing Vaccines with Patients and Parents" was significantly revised.
- Two new chapters on COVID-19 and Mpox were added.
- Tables, figures, and algorithms were greatly expanded to enable quick access to essential information.
- The System-Based Treatment Table was moved to the beginning of the book and reordered so that the grouped recommendations by body system are more easily and quickly accessible.
- Standardized approaches to disease prevention through immunizations, antimicrobial prophylaxis, and infection-control practices were updated throughout the *Red Book*.
- Reference to evidence-based policy recommendations were updated throughout the *Red Book*.
- Appropriate chapters were updated to be consistent with 2024 AAP and CDC vaccine recommendations, CDC recommendations for immunization of health care personnel, and drug recommendations from *2024 Nelson's Pediatric Antimicrobial Therapy*.
- The "Breastfeeding and Human Milk" chapter was updated to align with information in the 2022 AAP policy statement on breastfeeding.
- The listing of Codes for Commonly Administered Pediatric Vaccines, Toxoids, and Immune Globulins was expanded.
- *See all the updates in the Summary of Major Changes.*

The revised and updated *Red Book: 2024–2027 Report of the Committee on Infectious Diseases*, 33rd Edition on RBO is the easiest way to find infectious disease information with a robust search. Use the split-screen functionality to view *Red Book* chapter text, figures, images, tables, references, and related content side by side. Use the left side navigation to jump directly to chapter sections and take advantage of fully embedded links within these sections to quickly view supporting content, including more than 2,700 infectious disease images not found in the print version.

Red Book on RBO is continually updated between publication years—updates are posted on RBO when new recommendations are published as policy statements by the AAP or by other national or international organizations such as the CDC, NIH, Infectious Diseases Society of America, the Pediatric Infectious Diseases Society, and the World Health Organization. Find current updates on the Updates and Errata page.

And There's More…
Be sure to take advantage of all the valuable resources on RBO, including:



Diagnosis Detective

Can you solve it?

Diagnosis Detective challenges users to solve a new infectious disease case every month by providing a quick, case-based, review of an infectious disease while highlighting specific *Red Book* resources. Interested in submitting a case? See the detailed author instructions.

Webinars
View the following two new RBO Webinars, by Sean T O'Leary, MD, MPH, FAAP, Chair, AAP Committee on Infectious Diseases.

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2024 Red Book

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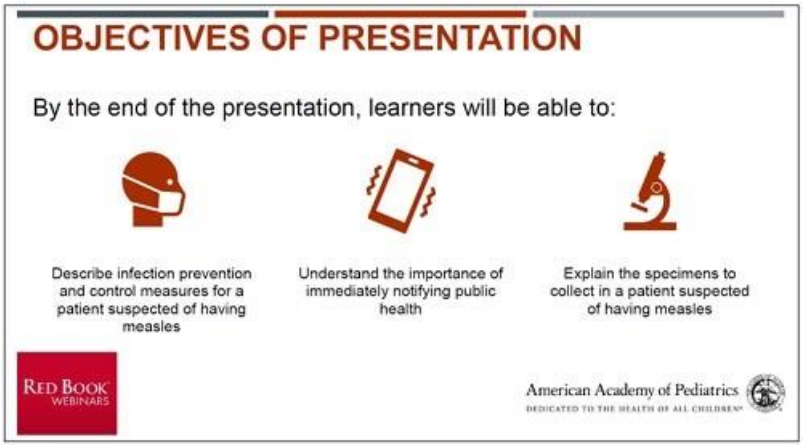

Diagnosing Measles in the Pediatric Setting
In this 10-minute webinar, Dr O'Leary describes the three steps pediatricians should immediately take if they have a patient suspected of having measles: isolate the patient, report to public health, and collect the appropriate specimens. Learn how to quickly diagnose measles and minimize the spread of the virus in your clinic and community.

Identifying Measles in the Pediatric Setting
In this 5-minute webinar, Dr O'Leary outlines the clinical features of measles, discusses the incubation and infection periods for measles and explains how pediatricians can assess the risk of measles in someone presenting to their office with symptoms.

Go to Red Book Online *today to see the new edition of* Red Book *and all the resources and features on the site!*

AAP Chapter Grants to Support Infectious Disease Education and Collaboration

The AAP Section on Infectious Diseases (SOID) is offering the opportunity for AAP Chapters to apply for a grant towards the development and integration of infectious disease-focused education into AAP Chapter activities.

SOID will offer three 1-year grants of up to $4,500 dollars each to AAP chapters. The grant period runs from November 1, 2024, until June 30, 2025. Grant applications are due by October 4, 2024.
Activities this grant might support include, but are not limited to, the following:

a. Creation of an infectious diseases subcommittee
b. Strengthening activities of an existing infectious diseases committee/subcommittee
c. Incorporating specific infectious diseases activities into the Chapter
d. Developing an initiative that promotes engagement of and/or collaboration among the various Chapter stakeholders including clinical and ancillary care providers
e. Assessment of Chapter needs, interests, and activities related to pediatric infectious diseases to inform future activities
f. Developing an educational conference, webinar, or podcast on an infectious diseases topic
g. Sponsoring of an expert infectious diseases presentation at a Chapter event

It is encouraged that the activities supported by this grant program focus on areas of interest to general pediatricians and other care providers with an interest in infectious diseases (eg, medical students, infection preventionists, etc.).

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AAP Chapter Grants

Continued from Page 15

Other considerations:
Grant funds **cannot** be used to:

- Fund social activities outside of an educational conference or event.
- Raise general funds for the Chapter.
- Offset expenditures for meetings or projects that have already taken place.
- Used for the purchase of food or beverages

Grant funding is limited to the following for educational programs:

- Maximum speaker honoraria = $750/speaker
- Maximum travel expenses (airfare, ground transportation, etc.) = $700/speaker
- Space rental cannot exceed $250 per day
- Audio visual cannot exceed $250 per day
- Marketing and distribution cannot exceed $5 per attendee

Grantees will be chosen by the SOID Executive Committee on the basis of the program's potential impact consistent with the SOID interest in the care of fetuses, newborn, infants, children, adolescents, and youth adults with infectious conditions; the promotion of prevention of these diseases; and the consistency between the program proposal and the submitted budget.

If selected, grantees must:

1. Acknowledge the AAP Section on Infectious Diseases on any materials that are created
2. Submit a short article for the Chapter Corner portion of the SOID newsletter
3. Submit a written report to the SOID Executive Committee at the mid-point of the grant period and within 30 days following the end of the grant period, which includes the following information:

- Chapter name
- Chapter point of contact name
- Summary of activities implemented
- Breakdown of how grant funds were spent and any evaluation/outcomes data; whenever possible Chapters should include information on how pediatric trainees or early career physicians were engaged in the Chapter's activities
- Infectious diseases topic(s) addressed
- Lessons learned

Technical Assistance and Support:
Each grantee will be paired with an SOID Executive Committee member for guidance as needed. SOID staff will also be available to provide support as needed.

Please email the **completed application** and budget to:
Jorie Ouimet
Staff contact to the Section on Infectious Diseases
Jouimet@aap.org
Application Deadline: 5:00pm central, Friday, October 4, 2024

Committee on Infectious Diseases

The COID published the following statements over the past six months:

1. The Committee on Infectious Diseases, Committee on Practice and Ambulatory Medicine and Committee on Bioethics published the clinical report Strategies for Improving Vaccine Communication and Uptake. The report offers guidance for pediatricians and others who care for children on the best ways to address vaccine concerns and increase immunization rates. This report includes information about the scope and impact of the problem, the facts surrounding common vaccination concerns, and the latest evidence regarding effective communication techniques for the vaccine conversation.
    a. AAP News Article: AAP report offers strategies to counter vaccine hesitancy
    b. AAP News Release: AAP offers strategies to improve communication on vaccines
    c. Pediatrics On Call Podcast: Improving Vaccine Uptake

2. The COID provided preliminary influenza vaccination recommendations for the 2024-2025 season. The annual influenza vaccination policy statement and technical report will be published in August 2024.

3. The COID and Section on Gastroenterology, Hepatology, and Nutrition published the clinical report Fecal Microbiota Transplantation: Information for the Pediatrician. This clinical report endorses the joint society statement by the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition, and the European Society for Pediatric Gastroenterology, Hepatology and Nutrition and is meant to provide the general pediatrician with a broad overview to enable appropriate guidance to families seeking fecal microbiota transplantation as treatment of a child's condition.

The following statements are in progress (CR = clinical report, PS= policy statement, TR = technical report):

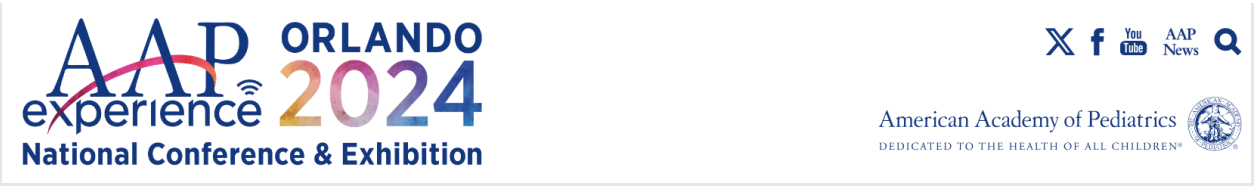
a) New intents

1. Intent to revise CR: Infectious Diseases Associated with Organized Sports and Outbreak Control (working on the intent)
2. Intent to revise PS: Cochlear Implants in Children: Surgical Site Infections and Prevention and Treatment of Acute Otitis Media and Meningitis (working on the intent)
3. Intent to revise TR: Immunizing Parents and Other Close Family Contacts in the Pediatric Office Setting (w/ Committee on Practice and Ambulatory Medicine, working on the intent)

b) Statements in Progress

1. Revision of CR: Infection Prevention and Control in Pediatric Ambulatory Setting (first draft)
2. Revision of PS: Medical Versus Nonmedical Immunization Exemptions for Child Care and School Attendance (w/ Committee on Practice and Ambulatory Medicine, Council on School Health, Committee on State Government Affairs, working on first draft)
3. Revision of CR: Strategies for Prevention of Health Care-Associated Infections in the NICU (w/ Committee on Fetus and Newborn, working on the first draft)
4. New CR on Strategies for the Prevention and Management of Invasive Candida Infections in the NICU (w/ Committee on Fetus and Newborn, working on the first draft)
5. New CR on Antibiotic Stewardship in the NICU (w/ Committee on Fetus and Newborn, working on the first draft)
6. Revision of PS: Medical Countermeasures for Children in Public Health Emergencies, Disasters, or Terrorism (w/ Council on Children and Disasters, working on the first draft)
7. New CR: Care of the Infant Exposed Congenitally to Cytomegalovirus (CMV) (w/ Committee Fetus and Newborn, Council on Children with Disabilities, Section on Otolaryngology-Head and Neck Surgery, working on the first draft)
8. Revision of TR: Non-Therapeutic Use of Antibiotics in Animal Agriculture: Implications for Pediatrics (w/ Council on Environmental Health and Climate Change, submitted to BOD

AAP National Conference & Exhibition 2024



Conference Registration Now Open!
September 27 – October 1, 2024
Orlando, Florida

Join us in Orlando for the 2024 AAP National Conference & Exhibition. We can't wait for you to connect in person, network with colleagues, participate in world-class education sessions, attend exciting special events, visit the exhibit hall, and much more!
A limited virtual attendee experience will also be available.

REGISTER NOW

Joint Program: Section on Infectious Diseases and Section on Epidemiology, Public Health and Evidence

Saturday September 28, 2024, 1:00 pm – 5:00 pm EDT

RSV disease among young children is an important cause of morbidity and mortality. Nirsevimab for infants and RSV vaccination of pregnant women have been developed to prevent RSV disease in young children. This program will review these interventions and potential challenges in rolling them out.

2024 Accepted General Sessions - Infectious Diseases

- Role of the Pediatrician in U.S. Tuberculosis Elimination
- Diagnosis and Treatment of Congenital Syphilis
- Group A Streptococcal Disease in the COVID-19 Era
- Current Strategies in the Management of Urinary Tract Infection
- What's New in Diagnosis and Treatment of CMV
- Antimicrobial Update: Optimizing Prescribing Trends While Minimizing Resistance
- Challenging Cases in Pediatric Infectious Disease
- Communicating Vaccine Science
- Diagnosis and Treatment of Community-Acquired Pneumonia
- Meet the Red Book Committee
- Vaccine Update: What's New?
- What Pediatricians Can Do about the Rising Rates of Vaccine Exemptions
- Neonatal CMV Testing: Universal, Targeting, or Something Else?

References

Recognizing and Managing Patients Presenting with a Concern for Measles

John (Jack) Flores, MD

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Traveler's Diarrhea – just when you thought you know what was safe - it's not necessarily so

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2. Travelers' Diarrhea | CDC Yellow Book 2024. Accessed March 24, 2024. https://wwwnc.cdc.gov/travel/yellowbook/2024/preparing/travelers-diarrhea
3. Riddle MS, Connor BA, Beeching NJ, et al. Guidelines for the prevention and treatment of travelers' diarrhea: a graded expert panel report. J Travel Med. 2017;24(Suppl 1):S63-S80. doi:10.1093/jtm/tax026

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