THE SECTION ON

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™

INFECTIOUS DISEASES

Volume 18, Issue 2

Fall 2015
NEWSLETTER

Chair's Letter

Warm Greetings SOID members! I hope everyone had a wonderful and relaxing summer. It is hard to believe that a new school year has started and that fall is just around the corner.

There have been several changes in the membership of the SOID Executive Committee that I would like to mention. We have welcomed several new training fellow liaisons starting this past July. Dr. Ishminder Kaur is a second-year pediatric infectious diseases fellow at St. Christopher's Hospital for Children in Philadelphia and has joined Dr. Rana Hamdy on the SOID Executive Committee. Dr. Emily Kaur, a second-year fellow also at St. Christopher's Hospital for Children and Dr. Zachary Willis, a third-year fellow at Vanderbilt University Medical Center have joined the SOID Education Subcommittee. In addition, Dr. Bob Frenck from Cincinnati Children's Hospital will be joining the Executive Committee as a member starting in November. I would like to take this opportunity to thank Dr. Lilly Immergluck for her valuable service as a member of the Executive Committee over the past year and for completing my membership term since I was elected to the Chairperson position. Lilly has been a tireless worker on the committee and her input has been invaluable. Finally, I am sad to share that Dr. William Hitchcock, a general pediatrician at the Children's Primary Care Medical Group in La Jolla, California and longtime member of the AAP and Section, passed away in June. We would like to extend our condolences and acknowledge his participation on the SOID as an Education Subcommittee member and his commitment to the care of children.

One of the major goals of the SOID is to strengthen our relationship with the Pediatric Infectious Diseases Society (PIDS) in order to expand the educational and networking venues available to our membership. The SOID continues to work with PIDS on the PREP ID Board Review course which was held in August and on other educational endeavors. In June, the pediatric infectious diseases (PID) workforce survey (jointly developed by SOID and PIDS) was released to all of our colleagues who trained in pediatric infectious diseases. The information from this survey will provide us some very

Continued on Page 2

INSIDE THIS ISSUE

Chair's Letter *Continued from Page 1*

important detailed information on the current state of the pediatric infectious diseases workforce, future trends as to the types of jobs that will be needed, and other potential areas of exploration. We also continue to work with other AAP sections to develop joint educational programs for the AAP National Conference and Exhibition (NCE). This is becoming an important way to provide infectious diseases education on a variety of topics to a larger group of both general and subspecialty healthcare providers.

I am proud and excited to announce that the S. Michael Marcy visiting professorship was officially launched this summer for the 2015-2016 academic year. We are pleased to share that the inaugural visiting professorship has been awarded to Sanford Children's Hospital in Sioux Falls, South Dakota. As a reminder, this program has been designed to bring nationally and internationally known pediatric infectious disease (ID) specialists to pediatric and family practice programs around the country that may not have or who have limited access to a pediatric ID specialist. The professorship would give these programs the opportunity to have the visiting professor address infectious diseases issues that the program may be dealing with and allow for ample interaction between the visiting professor and members of the program and community physicians in which the program is located.

Vaccination rates for human papillomavirus (HPV) vaccine in both teenage females and males remain well below the rates for other routine vaccines with only slight increases compared to last year. Data from the 2014 Centers for Diseases Control and Prevention (CDC) National Immunization Survey showed that overall rates of completion for the three dose series among US adolescent females and males between the ages of 13 and 17 years was 39.7% and 21.6% respectively. This is disappointing given that multiple studies have shown that this vaccine is having a significant impact on decreasing the incidence of genital warts and anogenital cancers. Because of the persistently low HPV vaccination rates, the CDC, AAP and other organizations are developing strategies to try and increase these rates. Several strategies that have been identified by the CDC as being effective in increasing HPV vaccination rates include: the development of collaborations between immunization and cancer organizations; having providers recommend HPV vaccine when recommending other routine vaccines at age 11 or 12 years and stressing that the vaccine prevents cancer; and sending reminders to parents when their child is due for vaccinations. Multiple members of the AAP SOID and COID have been working with the AAP to develop programs that are aimed at improving awareness and education of both healthcare providers and the public on the importance of administering HPV vaccines to the teenage population.

August marked National Immunization Awareness Month. The AAP recognized this with a series, "Medicine Before Vaccines," which was written by senior pediatricians and reminds parents what the practice of pediatric medicine was like before immunizations were available to protect against many vaccine preventable diseases. The stories are poignant reminders of the devastating effect that many serious infectious diseases had on childhood morbidity and mortality and the marked effect that vaccines have had on significantly reducing the morbidity and mortality seen. This series is definitely worthwhile and I encourage each of you to check it out.

Finally, whether you are a general pediatrician with a specific interest in infectious diseases or a pediatric ID sub-specialist, I encourage you to take advantage of the many educational opportunities in which the SOID is involved. Whether it is specific ID programs at the October 2015 NCE (2015 NCE in Washington, DC), attendance at the PREP ID Board Review Course (held August 17-22, 2015 in Chicago), or through the AAP SOID Website with new PediaLink courses, the SOID is strongly focused on the education of our members. New programs are in the works, so please stay tuned. I would also like to encourage members who are interested in serving the SOID on educational issues or who have suggestions for educational topics, the website or the newsletter to please contact us or complete the 8-question expertise and interest survey. Thank you to Dr. Joseph Cervia for volunteering to write the interesting article, "Reducing the Risk of Waterborne Healthcare-Associated Legionellosis in Neonates and Transplant Recipients and the four Chapters for sharing their ID experiences and initiatives in their states."

I very much look forward to receiving your ideas and suggestions as we go forth and thank you for your continuing interest and membership in the SOID. Please don't hesitate to contact Suzanne Kirkwood, the SOID manager and staff liaison at the AAP (SKirkwood@aap.org) or myself (ttan@northwestern.edu) to let us know how we can best serve your needs.

Best wishes for a great fall and winter.
Tina Q. Tan, M.D., FAAP, FPIDS, FIDSA

Section on Infectious Diseases Award for Lifetime Contribution In Infectious Diseases Education

This award is given annually to an Academy member who has made outstanding contributions to education in infectious diseases. The candidate's contribution is indicative of a substantial long-term dedication to the highest ideals of education. This year we are pleased to present the award to Dr. Leonard Weiner.

Dr. **Leonard B. Weiner** is Professor of Pediatrics and Vice Chair for Academic Affairs in the Department of Pediatrics at the State University of New York, Upstate Medical University, Golisano Children's Hospital, Syracuse, NY, where he serves as Pediatric Infectious Disease & Immunology Division Director.

Dr. Weiner is a member of the AAP, the Infectious Diseases Society of America and the Pediatric Infectious Diseases Society. He has served on several committees of the AAP, including the Committee on Infectious Diseases (1997-2003) and as a liaison to the Committee on Pediatric AIDS. He has been a board member of the AAP NY District II, Chapter 1(1988-1994) providing leadership in infectious diseases practice.

Over past 40 years, Dr. Weiner has exhibited continuous commitment to the education of trainees and practicing pediatricians. His nomination was supported by several former fellows who have emphasized his excellence as a role model, mentor and teacher. It is noteworthy that his former fellows and residents have been significantly involved in many research activities with Dr. Weiner. Even before research was mandated as a component of fellowship training, Dr. Weiner insisted that his fellows develop research projects and publish. One of his nominators noted that, "Virtually every publication on his CV was written in collaboration with a resident, fellow or junior faculty member." Many of his former fellows have since entered academic medicine and hold academic positions. As an attending on the primary care floor in community hospitals, he had the opportunity to interact and educate many practicing pediatricians. He is a sought after educator on a variety of topics at local, regional and national meetings.

Dr. Weiner's research activities have had a broad range involving outgrowths from case reports and correlations of microbiologic investigations. He has participated in multicenter studies on neonatal *Herpes simplex* and *Varicella* vaccines for children and seniors. He has been a principal investigator on NIH and New York State Grants for care and research regarding pediatric AIDS since 1986. He has published over 100 peer-reviewed papers and has made significant basic contributions to microbiology and immunology.

Please join us at the award presentation for Dr. Weiner to be held at the **Meet the Red Book Committee session (session S3009) on Monday, October 26, 2015 at 8:00 am at the AAP National Conference and Exhibition in Walter E. Washington DC Convention Center, East Salon AB.**

Welcome to our New SOID Members

If you know of others who might be interested in joining the Academy and the Section please have them call 1-800-433-9016 ext 5885 or go to www.aap.org. The "Become A Member" link will take them to an application. Current Academy members may join the Section by accessing the online application (member ID and login required).

ID Training Fellows Column: Antimicrobial Stewardship: A New Online Resource from the SOID

Rana Hamdy, MD, MPH, FAAP, J. Michael Klatte, MD, FAAP and Zach Willis, MD, FAAP

The Value of Antimicrobial Stewardship

Antimicrobial resistance is a significant and rising threat to public health, both within the United States and globally. At least 2 million people in the United States per year develop infections caused by antibiotic-resistant bacteria, resulting in at least 23,000 deaths annually. Antibiotic resistance is driven by overuse of antibiotics. Unnecessary antibiotic use also increases the risk for both *Clostridium difficile* infection and numerous antibiotic-related side effects. Antimicrobial stewardship programs (ASPs) have been shown to prevent medication errors, reduce healthcare costs, and reduce rates of infections caused by *Clostridium difficile* and multidrug-resistant bacterial pathogens. In March of 2015, The White House endorsed the value of antimicrobial stewardship with the National Action Plan for Combating Antibiotic-Resistant Bacteria. Among other recommendations, this plan directs the Centers for Medicare and Medicaid Services (CMS) to include formal antimicrobial stewardship activities as a condition of participation for all participating acute care U.S. hospitals by 2018.

Antimicrobial Stewardship in Pediatrics

The antimicrobial stewardship movement began in adult acute care facilities, but the past decade has witnessed a surge of stewardship initiatives in children's hospitals as well. One 2011 survey found that 42% of 38 freestanding children's hospitals in the U.S. had a formal antimicrobial stewardship program in place, while an additional 37% were in the process of developing a program. Of those existing programs, 81% had been established after 2007.[1] Since that survey included only freestanding children's hospitals, little is known about the status of stewardship in other pediatric inpatient settings.

Recent research has demonstrated the tremendous need to optimize antimicrobial use in the ambulatory pediatrics setting. Antibiotics are among the most commonly prescribed class of medications in children. Of the approximately 25 million antibiotic prescriptions given for pediatric acute respiratory tract infections on an annual basis, nearly half (11.4 million) are estimated to be unnecessary.[2]

While there is a clear need for antimicrobial stewardship in the ambulatory pediatrics setting, data necessary to guide ASP implementation for outpatient pediatric practitioners are currently scarce. Research interest in this area continues to grow. A group from the Children's Hospital of Philadelphia recently conducted a clinical trial utilizing a combination of clinician education and prospective audit with feedback, in a network of 18 pediatric offices. This intervention significantly reduced prescriptions written for both broad-spectrum antibiotics and off-guideline prescribing for pneumonia and sinusitis.[3] After the prospective audit ceased, these beneficial effects were not sustained.[4] These findings suggest that an outpatient ASP can be highly successful, and interventions must remain in place in order to achieve sustained positive impact.

Challenges in ASP Implementation

While stewardship programs are known to be beneficial, there can be numerous barriers to successful implementation. Many barriers are common to both the inpatient and outpatient settings. Most inpatient programs include an infectious diseases physician and a clinical pharmacist, who must both be compensated for their time. The necessary members of an outpatient ASP are less clearly defined, but time commitment is nevertheless required. The growing body of literature demonstrating the cost-effectiveness of stewardship programs provides justification for the costs of ASP implementation to hospital/practice administration.[5]

Restriction and/or timely monitoring of antimicrobial prescribing practices requires information technology resources, and may depend on a facility's existing ordering, billing, and record-keeping systems. Finally, ASP initiatives must be

Continued on Page 5

ID Training Fellows Column: *Continued from Page 4*

acceptable to clinicians, who may be sensitive to perceived intrusions on their autonomy. As many stewardship activities are 'unenforceable' recommendations, a program's success invariably rests on establishment of productive relationships with one's fellow clinician colleagues.

New Resources Coming on the SOID Website

The AAP Committee on Infectious Diseases, the SOID and the Pediatric Infectious Diseases Society (PIDS) will be convening a strategic planning meeting during the National Conference this fall to discuss the barriers to ASP implementation and to develop a strategy to address them. Based on this meeting, one of the goals is to develop a webpage to provide resources for clinicians with an interest in antimicrobial stewardship. The target audience will include general pediatricians, pediatric infectious diseases specialists, pediatrics- and ID-trained pharmacists, and any other pediatric clinicians with an interest in antimicrobial stewardship. The webpage, which will appear on the SOID website, will discuss evidence-based stewardship strategies, and provide numerous resources regarding the design and implementation of a successful stewardship program in both the inpatient and outpatient settings. These resources will include easy access to:

- CDC ASP implementation resources;
- ASP implementation guidelines from the Infectious Diseases Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Pediatric Infectious Diseases Society (PIDS);
- Journal articles defining the impact of antimicrobial stewardship in pediatrics;
- AAP and IDSA guidelines for management of common pediatric infections.

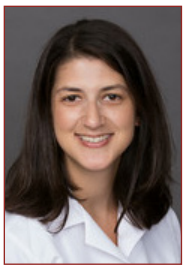
The AAP and PIDS recognize the value of antimicrobial stewardship in protecting children from harm and preserving the effectiveness of antimicrobials for future generations. The webpage, which will evolve as additional resources become available, will serve as a valuable resource for pediatric providers who want to begin or expand stewardship activities as effectively and efficiently as possible.

References

1. Newland JG, Gerber JS, Weissman SJ, et al. Prevalence and characteristics of antimicrobial stewardship programs at freestanding children's hospitals in the United States. *Infect Control Hosp Epidemiol.* 2014;35(3):265-271. doi:10.1086/675277.
2. Kronman MP, Zhou C, Mangione-Smith R. Bacterial Prevalence and Antimicrobial Prescribing Trends for Acute Respiratory Tract Infections. *Pediatrics.* 2014;134(4):e956-e965. doi:10.1542/peds.2014-0605.
3. Gerber JS, Prasad PA, Fiks AG, et al. Effect of an outpatient antimicrobial stewardship intervention on broad-spectrum antibiotic prescribing by primary care pediatricians: A randomized trial. *JAMA.* 2013;309(22):2345-2352. doi:10.1001/jama.2013.6287.
4. Gerber JS, Prasad PA, Fiks AG, et al. Durability of benefits of an outpatient antimicrobial stewardship intervention after discontinuation of audit and feedback. *JAMA.* 2014;312(23):2569-2570. doi:10.1001/jama.2014.14042.
5. Rüttimann S, Keck B, Hartmeier C, Maetzel A, Bucher HC. Long-term antibiotic cost savings from a comprehensive intervention program in a medical department of a university-affiliated teaching hospital. *Clin Infect Dis Off Publ Infect Dis Soc Am.* 2004;38(3):348-356. doi:10.1086/380964.

Welcome to Our New Training Fellow Liaisons

After receiving her medical degree in India, Dr. **Ishminder Kaur, MD, FAAP** came to Philadelphia to complete pediatric residency training at Einstein Medical Center. Starting in residency and continuing through her time as Chief Resident and then as a hospitalist, she pursued interests in infectious diseases as well as education and communication. This work led to abstract presentations regionally and nationally, as well as her first peer-reviewed publication and a teaching award. Being a steward for appropriate antibiotic use particularly resonated with Dr. Kaur, driving her to utilize the CDC *Get Smart* campaign to design educational activities for residents and faculty during her time as a hospitalist. Currently, Dr. Kaur is a second-year pediatric infectious diseases fellow at St. Christopher's Hospital for Children. With her interest in antibiotic stewardship, Dr. Kaur's research is focused on assessing risk factors for and outcomes related to pediatric infections with multi-drug resistant Gram-negative bacteria. Additionally, she is involved in educational efforts and policy writing and implementation as an active member of the hospital committees for infection prevention and antimicrobial stewardship. Dr. Kaur will serve on the **SOID Executive Committee** through June, 2017.



Emily Souder, MD, FAAP received her undergraduate degree in biology from Dickinson College and her medical degree from the Sidney Kimmel Medical College of Thomas Jefferson University. She completed three years of pediatric residency training, followed by one year as Chief Resident at St. Christopher's Hospital for Children in Philadelphia, Pennsylvania. During her year as chief, she was a member of the Section of Hospital Medicine and began to develop an interest in resident education through committee participation, daily resident teaching, Board review curriculum development, and presentations in regional and national workshops on education and mentorship. Currently, Dr. Souder is a second year infectious diseases fellow at St. Christopher's Hospital for Children. She is involved in pertussis research, focusing on pertactin expression by *B. pertussis* and its effects on clinical outcomes and drug susceptibility. Dr. Souder recently co-authored a book chapter discussing pertussis in the era of new strains. Dr. Souder will serve on the **SOID Education Subcommittee** through June, 2017.

Zach Willis, MD, FAAP, is a third-year fellow in Pediatric Infectious Diseases at Vanderbilt University. Dr. Willis received his medical degree from the Medical University of South Carolina before moving on to pediatric residency at Cincinnati Children's Hospital Medical Center. He began fellowship at Vanderbilt in 2013, where he is also completing a Masters of Public Health. His research projects focus on implementation of antimicrobial stewardship programs and the epidemiology of *Clostridium difficile* in pediatric oncology patients. In addition, he is working with the Tennessee Department of Health on the effort to certify Ebola Assessment Hospitals in the state. He has also been working with fellow SOID members Dr. Rana Hamdy and Dr. J. Michael Klatte on a webpage dedicated to pediatric antimicrobial stewardship. Dr. Willis will serve on the **SOID Education Subcommittee** this year.

From the ACIP Meeting of June, 2015

The slide sets of June 24-25, 2015 are available to view and the minutes for the meeting will be available soon.

AAP 2015-16 Influenza Resources

Policy

1. A new policy statement from the AAP updates recommendations for the prevention and treatment of influenza in children. "Recommendations for Prevention and Control of Influenza in Children, 2015-2016" is available online and will be published in the October issue of *Pediatrics*. Highlights for the upcoming 2015-2016 season include:
   a. The influenza vaccine for the 2015-2016 season is available in both trivalent and quadrivalent influenza formulations (no preference).
   b. The 2015-2016 influenza A (H3N2) and B (Yamagata lineage) vaccine strains differ from those contained in the 2014-2015 seasonal vaccines.
      i. Trivalent vaccine contains an A/California/7/2009 (H1N1) pdm09-like virus; an A/Switzerland/9715293/2013 (H3N2)-like virus; and a B/Phuket/3073/2013-like virus (B/Yamagata lineage).
      ii. Quadrivalent vaccine contains an additional B virus (B/Brisbane/60/2008-like virus [B/Victoria lineage]).
   c. The dosing algorithm for children 6 months through 8 years has been updated to reflect that virus strains in the vaccine have changed from last season.

These recommendations update the information in the Influenza chapter in the current edition of *Red Book* (p 476-493) and provide guidance on the prevention and treatment of influenza for the 2015-2016 season.

Also refer to the updated Vaccine Status Table and Influenza Resource page on *Red Book Online*, which have been updated to reflect the 2015-2016 influenza policy statement.

Please see the recent *AAP News* article for more information about the latest recommendations.

2. The Academy has reaffirmed its support for a mandatory influenza immunization policy for all health care personnel (HCP) nationwide. Read more in the related AAP News article.

Child Care Programs

Consider ways to increase influenza preparedness in child care programs. Share the AAP/CDC online PediaLink course "Influenza Prevention and Control: Strategies for Early Education and Child Care Programs" with local child care programs. This free course educates staff who work in Head Start and other early education and child care programs about influenza policies and strategies that help keep children healthy. Also share the new "Prepare for the Upcoming Flu Season!" from HealthyChildren.org.

ID Sessions at The AAP's National Conference and Exhibition (NCE) October 23-27, 2015, Washington, D.C.

The descriptions of the ID sessions sponsored by the SOID are on the Section website and the complete conference program can be accessed on the NCE website.

This year, the SOID is pleased to be co-sponsoring two Section programs in addition to the many general ID sessions. The first program being co-sponsored with the Section on Pediatric Pulmonology and Sleep Medicine will be held on Monday, October 26, 2015 at 8:00 am – 12:00 pm. This program will address common topics related to pulmonary complications of infectious diseases including Respiratory Syncytial Virus (RSV), Community Acquired Pneumonia (CAP) and Tuberculosis (TB). The second program being co-sponsored with the Section on Otolaryngology and Head and Neck Surgery and the Section on Allergy and Immunology is being held on Monday, October 2015 at 1:00 – 4:00 pm and will address the issues and guidelines regarding allergic rhinitis, rhinosinusitis and acute bacterial sinusitis.

Review of the Recent Infectious Disease Literature

These summaries and commentaries are completed by volunteer Contributing Editors from the SOID. Each is responsible for reviewing the current infectious disease literature for several journals. They select an interesting article and present it for your review to help keep you current on various issues.

Miller LG, Daum RS, Creech CB, et al. Clindamycin versus trimethoprim-sulfamethoxazole for uncomplicated skin infections. *N Engl J Med* 2015;372:1093-103.

Reviewed by: *Sherman J. Alter, MD, Professor of Pediatrics, Wright State University Boonshoft School of Medicine; Division of Infectious Diseases, Dayton Children's Hospital, Dayton, OH.*

Over the last two decades, methicillin-resistant *Staphylococcus aureus* (MRSA) has emerged as the chief cause of suppurative skin infections in many areas of the world, including the United States. Incision and drainage (I&D) is the primary recommended treatment modality for these purulent infections (furuncles, carbuncles, abscesses). The indications for adjunctive antibiotic therapy for patients with such infections, however, are less clear. This study evaluated the comparative efficacy and safety of two antibiotics in the treatment of skin infections.

This was a prospective, randomized, double-blind trial comparing clindamycin with trimethoprim-sulfamethoxazole (TMP-SMX) in the treatment of 524 outpatient adults and children from four centers (155, 29.6%, were children ≥6 months of age). Mean age was 27.1 years. Community-acquired MRSA was endemic in each locale. All abscesses underwent I & D. If possible, attempts were made to culture fluid from cases with cellulitis. Individuals with cellulitis and/or multiple or a single abscess larger than 5 cm received either oral clindamycin (264 persons) or TMP-SMX (260 persons). Any purulent fluid was cultured. Subjects were followed for one month after completion of therapy.

S. aureus was isolated from 72.7% (176/242) of subjects with abscesses +/- cellulitis. MRSA accounted for 83% of these isolates. Only 20% of subjects with cellulitis had cultures collected (11.4% MRSA, 0.4% *S. pyogenes*). Clindamycin resistance was noted in 12.4% of *S. aureus* isolates. Clinical cure rates were high and the proportion of patients cured was similar in the two treatment groups (466 patients could be fully evaluated; 89.5% cure in the clindamycin group and 88.2% cure in the TMP-SMX group, -1.2 percentage points; 95% CI, -7.6 to 5.1; P= 0.77). In the population that could be evaluated, there were no statistically significant differences in the treatment of abscesses +/- cellulitis (P = 1.00) and of cellulitis without abscess (P = 0.32). Cure rates at 1-month follow-up were similar for the clindamycin and TMP-SMX groups; 83.9% and 78.2%, respectively. Rates of adverse events were low and similar in the two groups.

Reviewer's Commentary:

This investigation reassures the clinician that use of either of two popular antibiotics, clindamycin or TMP-SMX, results in favorable outcomes among ambulatory patients with uncomplicated skin infections. Importantly, all of the abscesses in these patients underwent I&D which is the primary recommended treatment for abscesses, carbuncles, and large furuncles.[1] While all study subjects received antibiotics, such adjunctive antimicrobial therapy with I&D has generally been recommended in persons with systemic signs of infection, rapidly progressive disease, associated comorbidities including immunosuppression, very young or advanced age, abscesses in difficult to drain areas (face, hands, genitalia), associated septic phlebitis, and abscesses unresponsive to I&D alone.[1,2] A study group simply evaluating the outcome of I&D alone was not included in this trial. There were no large differences in efficacy between the two treatment regimens. Despite culture confirmation, most cases of cellulitis were likely caused by *S. pyogenes*. It is notoriously difficult to obtain culture material from areas of cellulitis. Provocatively, the authors do make a suggestion that TMP-SMX might be effective against *S. pyogenes*. This has not been documented other than in some cases of impetigo.[3] Clindamycin, however, is active against this organism. One could question the effect of clindamycin resistance noted in 12.4% of *S. aureus* isolates. Future studies should clarify the use of antibiotics in managing similar patients with uncomplicated skin infections, in treating individuals with smaller abscesses, and in the treatment of skin infections among more severely ill persons or those with underlying chronic illnesses.

Continued on Page 9

Review of the Recent Infectious Disease Literature *Continued from Page 8*

References:

1. Stevens DL, Bisno AL, Chambers HF, et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis 2014;59:147-59.
2. Liu C, Bayer A, Cosgrove SE, et al. Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant *Staphylococcus aureus* infections in adults and children. Clin Infect Dis 2011;52:e18-e55.
3. Bowen AC, Tong SY, Andrews RM, et al. Short-course oral co-trimoxazole versus intramuscular benzathine benzylpenicillin for impetigo in a highly endemic region: an open-label, randomized, controlled, non-inferiority trial. Lancet 2014;384:2132-40.

Tamma PD, Han JH, Rock C, Harris AD, Lautenbach E, Hsu AJ, Avdic E and Cosgrove SE; for the Antibacterial Resistance Leadership Group. Carbapenem Therapy Is Associated With Improved Survival Compared With Piperacillin-Tazobactam for Patients With Extended-Spectrum ß-Lactamase Bacteremia. Clinical Infectious Diseases 2015;60(9):1319–25.

Reviewed by: *Stephen C. Aronoff, MD FAAP, Temple University School of Medicine*

The goal of this study was to determine if there was a difference in mortality among patients with extended-spectrum ß-lactamase (ESBL) bacteremia treated empirically with piperacillin-tazobactam (PTZ) or a carbapenem (CP) and definitively with a CP. Adult patients with ESBL bacteremia were retrospectively identified from a microbiology database. Inclusion required initial therapy with PTZ or CP and definitive therapy with CP after identification of the pathogen. Exclusion criteria included treatment with a drug of another antimicrobial category (e.g. quinolones or TMP-SMX) or initial therapy with PTZ and subsequent determination of the PTZ MIC > 16 mg/ml for the ESBL isolate. The primary outcome was mortality within 14 days of the onset of bacteremia. A logistic regression model attempted to control for covariates, including age, Pitt bacteremia score, ICU level care, profound neutropenia (absolute neutrophil count ≤100 µg/mL), source of infection, underlying medical conditions, and immunocompromised status was used to develop a stable inverse probability weighted, propensity score.

Two hundred and thirteen patients (PTZ = 103, CP = 110) with a mean age of 48 years were included.

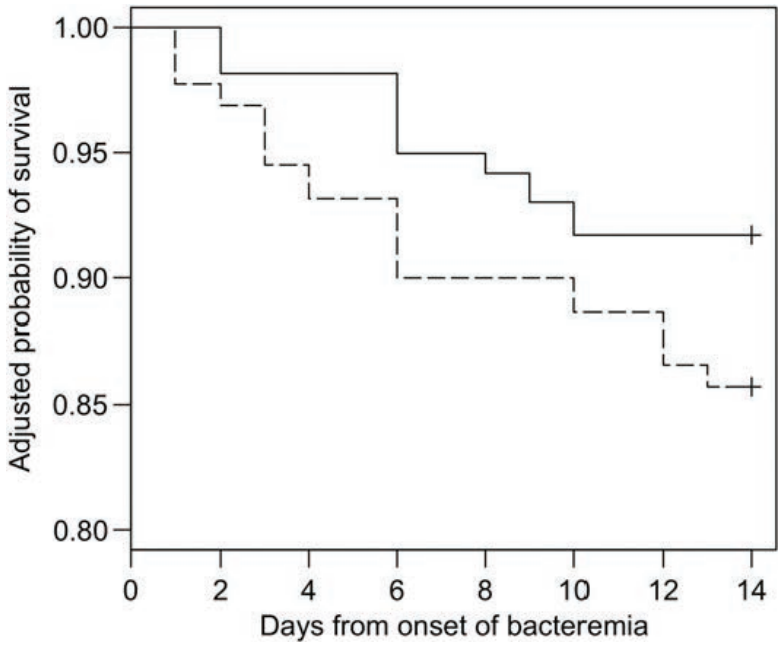


Figure 2. Probability of survival censored at day 14 for patients with extended-spectrum ß-lactamase (ESBL)-producing bacteremia in an inverse probability–weighted sample. Solid line represents individuals treated with CP for the entire duration of therapy; dotted line represents individuals treated with PTZ and converted to CP therapy after ESBL status was known; log-rank test = 0.03.

Reviewer's Commentary:
Current recommendations suggest that either PTZ or CP may be used as initial therapy in patients with suspected bacteremia caused by ESBL *Enterobacteriaceae*. This study suggests that CP may be a better choice. Of note, this was an analytic observational study (not a randomized clinical trial) conducted among adults (no children were included in the study population).

Continued on Page 10

Review of the Recent Infectious Disease Literature *Continued from Page 9*

Le Doare K, Bielicki J, Heath PT et al. Systematic review of antibiotic resistance rates among gram-negative bacteria in children with sepsis in resource-limited countries. *J of Pediatr Infect Dis* 2015; 4(1): 11-20.

Reviewed by: *Jane Gould, MD, FAAP, Associate Professor of Pediatrics, Drexel University College of Medicine, Hospital Epidemiologist, Attending Physician, Section of Infectious Diseases, St. Christopher's Hospital for Children, Philadelphia, PA.*

Due to concerns regarding increasing antimicrobial resistance globally, studies to ascertain the burden of multi-drug resistant organism (MDRO) infections especially from countries with limited laboratory facilities and choice of available antimicrobials is vital. Le Doare et al conducted a systematic review of literature from 2002 to 2013 using Pubmed, Embase and MEDLINE as well as the WHO regional databases for Africa, Asia and Latin America to identify studies of children with Gram-negative bacteremia occurring in low- and low/middle-income countries. To be included, studies were required to have used a recognized standard for interpretation of antibiotic susceptibility testing such as CLSI (Clinical and Laboratory Standards Institute) or an equivalent, had a recognized method to measure the antimicrobial effect on the bacteria in culture, could define how cases of presumed sepsis were identified, were able to quantitate the number of blood cultures obtained, number of isolates recovered and the number of patients from whom these pathogens were isolated. Studies performed exclusively on immunocompromised children were excluded. Using the GRADE assessment to score the quality of evidence, they identified 30 eligible studies for systematic review from Asia and Africa comprising 71,326 children. There were no pediatric studies of antimicrobial resistance in Gram-negative infections from Latin America published since 2002. Resistance to ampicillin, gentamicin, chloramphenicol, ciprofloxacin, cotrimoxazole, and ceftriaxone from Asia and Africa were identified. Weighted medians and interquartile ranges attributable to a resistant pathogen were calculated. Approximately 14% of all blood cultures obtained were positive, 8% of which were positive for Gram-negative bacteria (GNB). In neonates, *Klebsiella pneumoniae* was the predominant GNB accounting for 50% of all GNB and had the most drug resistance. In children, *Salmonella* spp., most commonly non-typhoidal, were the most common, with some studies in Africa having 85% resistance to ampicillin and 10% resistance to ciprofloxacin. Likewise, high rates of ampicillin, gentamicin and ceftriaxone resistance were seen in *Klebsiella and E. coli* isolates from children. Hospital-acquired infections with these organisms had even higher rates of resistance. One study from Egypt reported *Klebsiella* with 65% resistance to ceftriaxone, 30% resistance to imipenem and 50% resistance to amikacin.

Reviewer's Commentary:
This systematic review of GNB bloodstream infections in children from Asia and Africa should serve as a wake-up call to the world. The increasing prevalence of multidrug resistance among GNB, with some of organisms having very few effective options for treatment, in the face of a dwindling antimicrobial drug development pipeline is a global tragedy. The Infectious Diseases Society of America has made efforts to try to combat this problem by supporting legislative and research efforts as well as antimicrobial stewardship and infection prevention programs. Every pediatrician can help by making their own concerted effort to use antimicrobials more judiciously in both the inpatient and outpatient settings.

Mina MJ, Metcalf CJ, de Swart RL et al. Long term measles-induced immunomodulation increase overall childhood infectious disease mortality. Science 2015; 348 (6235): 694-699.

Reviewed by: J*ane Gould, MD, FAAP, Associate Professor of Pediatrics, Drexel University College of Medicine, Hospital Epidemiologist, Attending Physician, Section of Infectious Diseases, St. Christopher's Hospital for Children, Philadelphia, PA.*

The introduction of mass measles vaccination has reduced childhood mortality by 30 to 50% in resource-poor countries and by as much as 90% in the most impoverished populations. The reduction in infectious disease mortality after measles vaccination is of long duration, lasting throughout the first five years of life. This beneficial effect on mortality cannot be explained solely by prevention of measles infection. Interestingly, measles infection itself is known to result in immunosuppression. A possible mechanism to explain the nonspecific beneficial effects of measles vaccination as well as the phenomenon of measles immunosuppression is a loss of immune memory cells after measles infection. These

Continued on Page 11

Review of the Recent Infectious Disease Literature *Continued from Page 10*

memory cells are replaced by measles-specific lymphocytes, resulting in "immune amnesia" to non-measles pathogens. Measles vaccination prevents this "immune amnesia".

Using population-level data from England, Wales, Denmark, and the United States, the investigators demonstrated the prolonged negative effect on host resistance to infectious diseases following measles infection. They tested four hypotheses: 1) non-measles mortality should be correlated with measles incidence data since the onset of vaccination reduces the latter, 2) an immune memory loss mechanism should present as a strengthening of this association, 3) the strength of this association should be greatest when the mean duration over which the cases are accumulated matches the mean duration required to restore immunological memory after measles infection and 4) the estimated duration should be consistent with both the available evidence of increased risk of morality after measles compared with uninfected children and the time required to build protective immunity in early life.

They found a reduction in non-measles infectious disease mortality for children 1 to 9 years old in Europe and 1 to 14 years old in the United States shortly after the onset of mass measles vaccination. To address the hypothesis of immunomodulation post-measles, the investigators transformed measles incidence into population prevalence of measles immunomodulation with the time required to restore protective immune memory. They found the best-fit duration of immunomodulation at 28.3 months, corresponding with a significantly improved association between measles and all-cause infectious disease mortality. They analyzed data from the pre-vaccination era alone and found the best-fit duration of measles immunomodulation was no different (28 vs 28.3 months) and closely matched the duration identified in the post-vaccine era (29.2 months). With the exception of rubella and sepsis, the best-fit durations of immunomodulation predisposing to individual classes of infectious disease mortality lasted between 18-30 months (mean 27 months, median 24 months). They also analyzed the relationship according to gender, and they found consistently stronger associations among females (consistent with previous investigators' findings).

Additionally, a similar analysis was performed using pertussis which is not known to be immunosuppressive. They found no correlation between pertussis incidence and non-pertussis infectious disease mortality.

In summary, measles vaccination has additional benefits beyond protecting against measles infection by reducing childhood mortality from other infectious diseases. A similar effect has recently been demonstrated with BCG vaccination used in infancy to prevent tuberculosis in tuberculosis-endemic countries. Multiple studies have suggested that BCG vaccination lowers mortality by preventing neonatal sepsis and overall respiratory infections in childhood. BCG reprogramming of innate immune cells by induction of NOD2 (an intracellular pattern recognition receptor)-dependent effects on monocytes has recently been demonstrated.[1]

References:

1. Kleinnijenhuis J, Quintin J, Preijers F et al. Bacille Calmette-Guerin induces NOD2-dependent nonspecific protection from reinfection via epigenetic reprogramming of monocytes. *Proc Natl Acad Sci* 2012; 109:17537-42.

Policy Highlights from the Committee on Infectious Diseases (COID)

AAP statements under development

1. Updated Meningococcal Vaccine Recommendations
2. Infection Prevention and Control in Pediatric Ambulatory Setting
3. Vaccine Hesitancy
4. Adolescent Immunizations
5. Prevention and Treatment of Congenital Toxoplasmosis
6. Infection Control in Organized Sports
7. Biologic Response Modifiers
8. Antimicrobial Stewardship in Pediatrics

Statements in Revision

1. Chemical-Biological Terrorism and Its Impact on Children
2. Acute Otitis Media and Meningitis in Children with Cochlear Implant
3. Non-Therapeutic Use of Antibiotics in Animal Agriculture: Implications for Pediatrics
4. The Use of Systemic and Topical Fluoroquinolones in Children

The following AAP clinical practice guidelines are in the process of development:

1. Fever in Infants Under 3 Months of Age

Guidelines in Progress with External Organizations

1. HICPAC is working on a guideline for prevention of infections among patients in neonatal intensive care units (NICU)
2. Kawasaki Disease and Endocarditis with Committee on Cardiovascular Disease in the Young (*AHA*)
3. Diagnosis and Management of Bone and Joint Infections (IDSA/PIDS)
4. Clinical Guidelines for Diagnosis and Antiviral Management of Seasonal and Pandemic Influenza in Adults and Children (IDSA)
5. Inappropriate Antibiotic Use for Acute Respiratory Tract Infections (AHRQ)

Reducing the Risk of Waterborne Healthcare-Associated Legionellosis in Neonates and Transplant Recipients

Joseph S. Cervia, MD, MBA, FACP, FAAP, FIDSA, FPIDS, Clinical Professor of Medicine and Pediatrics, Hofstra North Shore-LIJ School of Medicine;Regional Medical Director, HealthCare Partners, IPA & MSO

The US Centers for Disease Control and Prevention (CDC) estimates indicate that healthcare-associated infections (HAIs) account for over 700,000 infections and 75,000 deaths annually in American hospitals[1]. Along with the use of alcohol-based disinfectants for hand hygiene, hand washing with tap water and soap remains an important strategy in the battle to reduce HAI. Yet hospital tap water has been, and is increasingly recognized, as a source of such infections. In addition to infections with *Legionella pneumophila*, the pathogen most frequently recognized as arising from water sources, a number of other microbes, including multi-drug resistant Gram-negative bacteria (GNB) such as *Pseudomonas aeruginosa*, *Stenotrophomonas maltophilia*, *Acinetobacter* species, *Klebsiella pneumoniae*, and *Enterobacter cloacae* are increasing being recognized in waterborne outbreaks.

Wei et al,[2] recently reported two cases of neonatal legionellosis associated with infant formula prepared with hospital water. Water from both hospitals was positive for *L. pneumophila*, with molecular profiles indistinguishable from those of infected neonates. As this and other reports have established, control of waterborne pathogens (WBPs) such as *Legionella* in healthcare institutions remains a work in progress.

Recently, thought-leading centers have recognized the efficacy and cost-effectiveness of performing routine microbial analyses of tap water in at-risk patient areas, and employing one or a combination of preventive measures, including: hot water flushing of plumbing, chlorination, chlorine dioxide, monochloramine, copper-silver ionization, ultraviolet light, ozonation, and point-of-use (POU) water filtration. Each method has advantages and disadvantages related to ease of implementation, cost, maintenance issues, and short- and long-term effectiveness. Although randomized, controlled trials comparing the efficacy of these strategies have been lacking, guidelines for prevention utilizing them have resulted in significant declines in healthcare-associated legionellosis.[3] Efforts at WBP detection and control are complicated by the role of biofilm, comprised of microbes embedded in polymeric matrix attached to internal plumbing surfaces, which affords WBP protection from adverse environmental conditions, including antimicrobial agents and systemic controls (e.g. ultraviolet light, metals, acid pH).[4,5]

Though biofilm is highly prevalent, clinical infection risks attributable to WBPs are not evenly distributed among exposed individuals. In normal hosts, bacterial exposures from environmental water sources are typically cleared by innate defenses. On the other hand, immunocompromised hosts such as bone marrow transplant (BMT) recipients, neonates and critically ill individuals are likely to be at higher risk.[6]

Prevention offers a clinically beneficial and cost-effective alternative to intermittent case detection and outbreak control. For example, it has been demonstrated that reduced infection rates may be obtained in units caring for immunosuppressed patients employing water filtration at the POU even in the absence of a recognized outbreak.[7]

It has been suggested that hospital water distribution systems are among "the most overlooked, important, and controllable sources of HAI."[8] Available evidence in the peer-reviewed literature has demonstrated that hospital tap water contains microbial pathogens, and that biofilms in water delivery systems resist disinfection and deliver pathogenic organisms into the healthcare environment. At-risk patients are susceptible to infection through direct contact, ingestion, and inhalation of WBPs. Systemic water treatment technologies reduce levels of recognized WBPs; however, they vary in initial and long-term maintenance costs, efficacy against specific organisms, and compatibility with facility plumbing system materials. Moreover, they do not permanently and completely eradicate biofilms within healthcare facility plumbing. Finally, existing POU filtration technologies have been reported to interrupt clinical outbreaks of infection due to recognized WBP in the healthcare environment, and can represent a critical component of a comprehensive infection control strategy, particularly when pro-actively targeted for patients at high risk.

Continued on Page 14

Reducing the Risk of Waterborne Healthcare-Associated . . . *Continued from Page 13*

Although further efforts to systematically evaluate the relative efficacy and cost-effectiveness of WBP control measures are clearly needed, an enlightened approach to prevention includes routine microbial analysis of tap water in high-risk patient units, employment of systemic water disinfection technology, and POU water filtration in units wherein care is rendered for patients, such as neonates and transplant recipients, who are most vulnerable to Legionella and other WBP.

References:

1. CDC. Estimates of healthcare-associated infections. US Department of Health and Human Services. Available at http://www.cdc.gov/ncidod/dhqp/hai.html. (Accessed June 26, 2015).
2. Wei S, Chou P, Tseng L, et al. Nosocomial Neonatal Legionellosis Associated with Water in Infant Formula, Taiwan. *Emerg Infect Dis*. 2014;20:1921-1924..
3. Squier C, Stout J, Krsytofiak S, et al. A proactive approach to prevention of health care-acquired Legionnaires' disease: the Allegheny County (Pittsburgh) experience. *Am J Infect Control*. 2005;33:360-367.
4. Donlan R. Biofilms: microbial life on surfaces. *Emerg Infect Dis*. 2002;8:881-890.
5. Lindsay D, von Holy A. Bacterial biofilms within the clinical setting: what healthcare professionals should know. *J Hosp Infect*. 2006;64:313-325.
6. Prince A. Biofilms, antimicrobial resistance, and airway infection. *N Engl J Med* 2002; 347: 1110-1111.
7. Cervia J, Farber B, Armellino D, et al. Point-of-use water filtration reduces healthcare-associated infections in bone marrow transplant recipients. *Transpl Infect Dis*. 2010;12:238–241.
8. Federal Register. "Part II: Department of Health and Human Services Centers for Medicare & Medicaid Services 42 CFR Parts 411, 412, 413, 422, and 489 Medicare Program; Changes to the Hospital Inpatient Prospective Payment Systems and Fiscal Year 2009 Rates…" Tuesday, August 19, 2008. 73(161):48471-48487.

What Does ICD-10-CM Mean for SOID Members?

Margaret Ikeda, MD, FAAP, SOID RBRV/Coding Chair, in private practice since 1992

October 1, 2015 is the date to start claims coding using the International Classification of Diseases 10th Edition, Clinical Modification know as ICD-10-CM diagnosis codes.

The requirement to use the new diagnostic codes does not affect procedure or CPT codes, and is not intended to change the way a physician practices medicine. It is akin to switching from the library book Dewey Decimal System to the Library of Congress Classification. The switch to ICD-10-CM has been delayed twice, but will now take effect on October 1, 2015. There were a few rumblings that there might be another delay this year, but in the end most of the major organizations, including the American Hospital Association, Blue Cross/Blue Shield, the College of Healthcare Information Management Executives and major vendors were on board and pushed for the change. Furthermore, ICD-10 had already been put in place in other parts of the world.

The characteristics of the new coding edition as described in the Official Preface of the ICD-10-CM Manual are that it exceeds its predecessors in the number of concepts and codes provided. The disease classification has been expanded to include health related conditions and to provide greater specificity at the 6th and 7th character level for many conditions. These characters are not optional and are intended to record information that is documented in the clinical record.

The other revisions of ICD-10-CM include "adding information relevant to ambulatory and managed care encounters; expanding injury codes; creating combination diagnosis/symptom codes to reduce the number of codes needed to fully diagnose a condition; incorporating common 4th and 5th character classifications; new classifications specific to laterality; and classification refinements for increased data granularity" meaning more encoded detail, in other words, a coding paradise.

Billing Consequences of ICD-10-CM

There is a grace period of no penalties for Medicare Part B claim errors using less specific diagnostic codes, but there is no grace period for any other claims submitted. Therefore, it is recommended that claims for dates prior to October 1st should not be coded with services provided after October 1st. And yes, physicians are expected to know and use the new diagnostic codes. Generally, the new ICD-10-CM codes are much more specific than the old codes and use updated clinical language. There are allowances for not getting the correct specific code, and claims will be paid as long as the correct family of codes is used. However, it is not known how long this initial claims period will last, so it is in everyone's best interest to use the correct codes from the start.

Use of the Alphabetic Index vs. the Tabular List

The new ICD-10-CM manual is divided into an Alphabetic and a Tabular list. While it is tempting to assign a code from the Alphabetic Index, it is not possible to do this with the ICD-10-CM manual, due to the specificity of the new codes. For example, after looking up pneumonia, which has two pages of entries in the Alphabetic Index, and deciding on pneumococcal, including bronchial and lobar, the next step is to go to the Tabular List in the second half of the ICD-10-CM, and look-up the letter and number entry, J13, noting nearby entries as well as exclusions and associations. If pneumococcal pneumonia is a complication of influenza for example, the codes for influenza must be listed. If you really mean lobar pneumonia without a confirming test, you are directed to J18.1 lobar pneumonia, unspecified organism. If there is an associated lung abscess, you are directed to the family of codes, J85, and must choose from gangrene, abscess of lung with pneumonia, and abscess of lung without pneumonia. If you mean pleural effusion, there are multiple codes relating to pleural effusion, pneumothorax, and other pleural conditions. In all, the diseases of the respiratory system section, J00-J99, encompass 12 pages of very small type. The good news is that the respiratory diseases section is relatively simple with only 4 and five character codes.

To decide on the proper ICD-10-CM codes, start with a conditions such as pneumonia. So, for example, and office visit

Continued on Page 16

What Does ICD-10-CM Mean for SOID Members? *Continued from Page 15*

for pneumococcal pneumonia in ICD-9-CM becomes the following in ICD-10-CM:

1. Clinical condition: **lobar pneumonia**. Find the Alphabetic Index under pneumonia, not lobar. Go to the Tabular Section, Chapter 10, Diseases of the Respiratory System (J00-J99), and choose from acute J18.9, lobar J18.1 and bacterial J15.9. Just as in ICD-9-CM, an unspecified code is the least optimal choice, but may be appropriate if no further details are available at the time of the encounter. The condition, pneumococcal pneumonia is J13.
2. Read the notes listed at the beginning of the J section, Chapter 10 Respiratory System. Use additional codes for environmental factors and tobacco use. Note the inclusions and exclusions.
3. Signs and symptoms and abnormal clinical laboratory tests are not included and refer to section R00-R94. If a diagnostic respiratory panel was used to diagnose pneumococcal disease, an additional diagnostic code of R84.5 can be added along with J13.
4. Choose an underlying congenital condition code such as E84.0 cystic fibrosis with pulmonary manifestations (Endocrine Section) if relevant. Perinatal and congenital conditions are coded throughout life if the condition is still causing morbidity.
5. Finally, an encounter code from the Z section may be chosen if the person who may or may not be sick has a procedure done, or if the finding of pneumonia was incidental to a health visit for other reasons, such as a well visit or a pre-procedural examination for screening. The Z codes replace and expand upon the ICD-9-CM V codes for encounters.

The AAP's Pediatric Crosswalk, ICD-9-CM to ICD-10-CM 2013 suggests thinking in the following steps. Use the codes to identify reasons for the patient encounter. Only confirmed diagnoses are coded and code with the highest degree of specificity, using up to 7 characters when indicated. Code co-existing conditions and chronic diseases, if related to the patient's treatment. Do not code conditions that do not exist or have resolved at the time of the encounter. When ancillary diagnostic or therapeutic services are provided, such as urine culture, parenteral antibiotics, or PPD, list the diagnosis or problem for which the services are being provided and the appropriate Z (formerly V) code for the services. Make sure that exceptions and inclusions are verified for each section and each code, before making a final coding decision.

Although the ICD-10 seems daunting at first, it does build on the ICD-9 and is quite logical. Once you become used to the conventions, it seems to be more user friendly than the old coding system. Some ICD-10-CM manuals that are available may include coding examples (e.g., Optum 360 ICD-10-CM Expert for Physicians). The Respiratory Chapter of ICD-10 gives diagnostic coding examples of asthma, acute respiratory failure, sequencing respiratory failure and another condition, influenza, ventilator associated pneumonia, and ventilator associated pneumonia developing after admission. Some other examples from ICD-10:

1. J02.9 Acute pharyngitis, unspecified
2. J02.8 Acute pharyngitis due to other specified organisms, excludes coxsackie, GC, herpes, mono, enteroviral. Tabular list directs coder to specific sections for the above exclusions.
3. J02.0 Streptococcal pharyngitis
4. J31.1 Chronic nasopharyngitis, excludes acute
5. N39.0 Urinary tract infection, site not specified,
6. J12 Viral pneumonia, not elsewhere classified, read inclusions and exclusions, and proceed to specific codes.
7. J12.0 Adenoviral pneumonia
8. J12.1 RSV pneumonia
9. J12.3 Human metapneumovirus pneumonia
10. A15-A19 Tuberculosis
    a. This is an example where the coder must read the Inclusions and Exclusions at beginning of the coding section on TB.
    b. Excludes congenital TB, non-specific reactions to TB test, pneumoconiosis associated with TB, a positive TB skin

Continued on Page 17

What Does ICD-10-CM Mean for SOID Members? *Continued from Page 16*

test without active TB, sequelae of TB, and silicotuberculosis

c. These codes include infections due to *M. tuberculosis and M. bovis*

For those who wish to explore and find more information on the new ICD-10-CM codes and rules, you can go to the CMS website: www.roadto10.org I recommend reading the interactive case studies, the medical studies and the specialty references section on Pediatrics.

Resources:

- Optum 360 ICD-10-CM Expert for Physicians, Complete Official Code Set, Valid October 1, 2015 through September 30, 2016, Published 2015, Optum360, LLC.
- AAP Pediatric ICD-10-CM: A Manual for Provider-Based Coding
- Principles of Pediatric ICD-10-CM Coding

  This practical readiness and training tool offers quick and easy access to a wealth of pediatric-specific guidance for diagnosis coding. Sections within each chapter include coding scenarios, guideline instructions and Notable Change alerts.
- Pediatric Code Crosswalk: ICD-9-CM to ICD-10-CM

  This handy quick reference can help practices integrate the ICD-10-CM nomenclature and code set. The updated 2nd edition provides time-saving coding tips, tables and tools specific to the cross-walked codes
- AAP News Article: ICD-10-CM: back to basics

Next article: **How to Streamline ICD-10 Coding in Your Practice!**

SOID Travel Grant Awards

One of the roles of the SOID is to promote the education of those physicians interested in infectious diseases. We are pleased to be able to offer NCE travel grants to AAP members who are residents with an interest in infectious diseases and ID fellows in training. In addition, this year we also offered travel grants for infectious diseases fellows in training planning to take their infectious diseases board certification exam in November to attend the PREP ID course held in Chicago this past August. The following recipients were selected by lottery and will receive/have received $1,200 to defer the costs of airfare, registration, hotel, meals, and incidentals to attend one of these two events.

NCE Travel Grant Recipients:

Tessa Commers, MD Children's Mercy Hospital Kansas City, MO	**Dustin Flannery, MD** Children's Hospital of Philadelphia Philadelphia, PA

PREP ID Travel Grant Recipients:

Caitlin Hansen, MD, FAAP Stamford, CT	**Grant Paulsen, MD, FAAP** Cincinnati, OH

AAP State Government Affairs Updates

Ian Van Dinther, Senior State Government Affairs Analyst, AAP Department of Community, Chapter and State Affairs

Update on Screening for Cytomegalovirus (CMV) in Newborns

State legislators again delved into the contentious issue of CMV screening for newborns who fail an infant hearing test. Bills introduced in 2015 initially focused on mandated screening for CMV, modeled after a similar bill enacted in Utah in 2013 (and as highlighted in the Spring 2014 SOID newsletter), but state legislators largely responded to concerns by AAP chapters and others within the physician community, and amended provisions that would have created screening and treatment requirements that conflict with current guidelines.

All told, Hawaii, Illinois, and Texas enacted legislation this year requiring their state departments of public health to educate the general public about prevention of CMV transmission. The Illinois bill is still awaiting signature by the governor. Additionally, a similar bill introduced in Tennessee was not enacted.

However, Connecticut enacted a bill that mandates CMV screening "as medically appropriate" following a failed newborn hearing screening, but doesn't require counseling on treatment options. It also creates a state public health education program on CMV transmission.

Pediatricians and their subspecialty colleagues in infectious diseases should understand the implications of these potential restrictions on their practices, and also lend their voices and expertise to advocacy efforts on this issue going forward. Creating new requirements that delegate medical practice standards and clinical decision-making to the legislative process—no matter how well-intentioned—is a risky proposition.

Childhood Immunizations

A seismic shift in public opinion has taken place in the wake of the Disneyland measles outbreak, leading state lawmakers to consider legislative measures that would reform or eliminate nonmedical exemptions to school entry immunizations requirements.

According to a May 2015 Truven/NPR poll, over 90% of adults—parents and non-parents alike—agree that children attending public school should be required to receive all recommended vaccinations unless medically unable to do so.

California's successful enactment of SB 277, legislation to repeal its nonmedical exemption, garnered considerable media attention. The successful effort was led by AAP Fellow and member of the California Senate, Dr Richard Pan. See related *AAP News article*.

SB 277 isn't the only story out of state legislatures on immunization policy this year, however:

- Vermont repealed its philosophical exemption statute, leaving only religious reasons for refusing vaccines required for school entry.
- Illinois enacted legislation tightening requirements for applying for a religious exemption to school entry immunization requirements.
- Connecticut also enacted a bill requiring applicants for religious exemptions to sign and notarize a statement that they have reviewed and understand the risks of failing to immunize their children.
- Delaware enacted legislation requiring parents to attest similarly, and to state that they understand that their children will be excluded from school in an outbreak of vaccine preventable disease.
- Legislation was introduced in mid-July in New York to eliminate the state's religious exemption to school entry immunization requirements.
- Bills that would have expanded nonmedical exemptions in Mississippi, Montana, and West Virginia were all defeated.
- The state legislature of Maine also enacted legislation to tighten nonmedical exemptions, but the bill was vetoed by the governor.

Continued on Page 19

AAP State Government Affairs Updates *Continued from Page 18*

Other important developments related to state level immunization policy this year:

- New Mexico successfully enacted a bill to finance its universal vaccine purchasing program.
- Illinois also enacted a bill that will require child care workers to be immunized against childhood communicable diseases.
- Ohio added meningococcal vaccination to its adolescent school entry immunization requirements.
- Via administrative rulemaking, Rhode Island added HPV to its school entry requirements.
- The American Medical Association (AMA) at its annual House of Delegates meeting adopted a resolution (sponsored to the AAP delegation to the AMA) calling on states to repeal their nonmedical exemption statutes.

Next year, additional states are expected to act on these and other issues related to childhood immunizations—either repeal or reform of nonmedical exemption statutes, publication of vaccination rates by school, or other means of promoting childhood immunizations and ensuring that children are protected against vaccine preventable diseases.

For more information:
Contact Ian Van Dinther at ivandinther@aap.org or at (847)434-7092

Additional Resources:
State AdvocacyFOCUS: Childhood Immunizations
Immunization infographic

ID Pearls and Other Gems: Molecular Diagnostics Clarify Frequency and Seasonality of New and Established Respiratory Viral Infections

Christopher J. Harrison, MD, FAAP, FPIDS,
Professor of Pediatrics at the Children's Mercy Hospital and UMKC, Kansas City, MO.

Dr. Harrison will be happy to receive contributions from you and, if published, will be duly cited.
Please send them to charrison@cmh.edu.

Frequent URIs in young children. Have parents told you, "He seems like he has had a cold all of his life", referring to a child less than two years of age? When I first began practice, I thought it impossible to be continuously symptomatic with URI symptoms. I had supposed that I was dealing with an overly vigilant parent. However, recent evidence may support just such a contention for at least a proportion of children.

Children average ~5 viral upper respiratory tract infections (URIs) per year in the first two years of life.[1-3] We also know that the rate is somewhat lower in children who stay at home with few or no siblings, compared to those who attend day care or who reside in families with many siblings.[1] It also seems that children living in a home where family members smoke cigarettes and those with evolving allergic conditions have more symptoms with viral URIs than other children. Add in extra days of illness from secondary bacterial infections such as acute otitis media and the ill days add up.

If the average child has 5 URIs/year and 7-14 days of symptoms/URI, then an average child can expect URI symptoms in up to 70 days in the first year of life. Given that up to 15% of children have 10 URIs in the first year of life, this URI-prone subset can expect up to 140 URI symptomatic days in the first year of life. Add an average of 15 days per year with

Continued on Page 20

ID Pearls and Other Gems: Molecular Diagnostics . . . *Continued from Page 19*

secondary bacterial infections and a child could be symptomatic with respiratory symptoms nearly half of the days of the first year of life.

If we add days with rhinorrhea or congestion due to allergies or teething (I realize the latter is controversial but I think most of us would concede that infants actively "cutting" teeth appear at least somewhat congested with some rhinorrhea), then perhaps the apparently overly concerned parent may merely be reporting a real-life experience at the wrong end of the URI epidemiologic bell shaped curve.

Traditional Seasonality. So why do practicing clinicians care? One reason is that we are about to enter the part of the year known as "respiratory viral season" which begins each autumn and may in part be related to the annual trek back to school.[3] Figures 1-4 show the burden of many respiratory viruses in the Kansas City region for 2014-2015 and their relative seasonality.

Figure 1

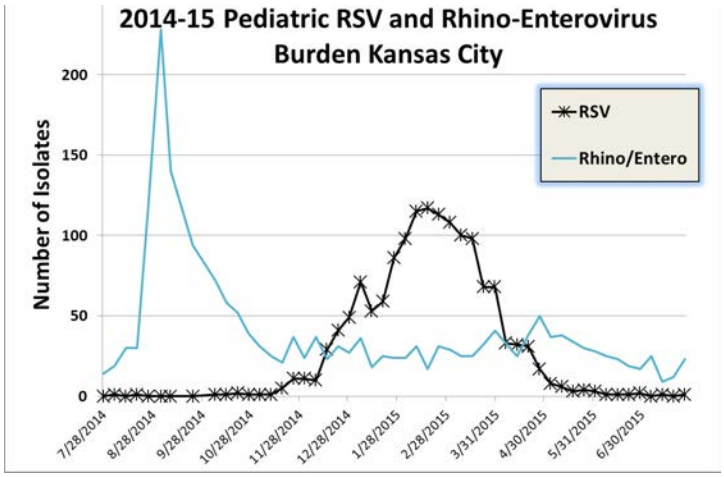


Figure 2

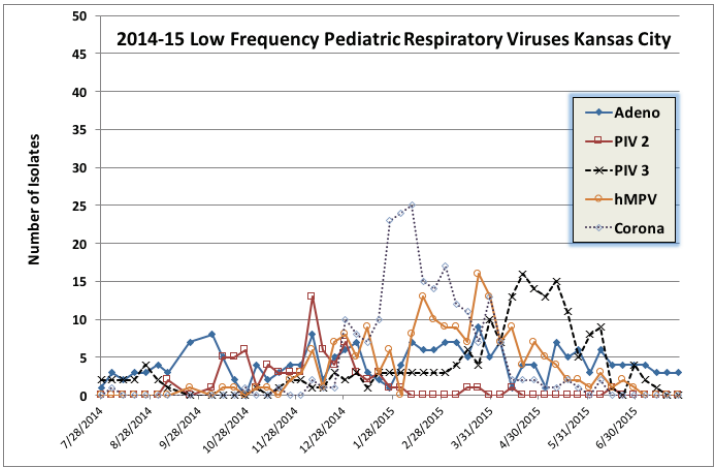


Figure 3

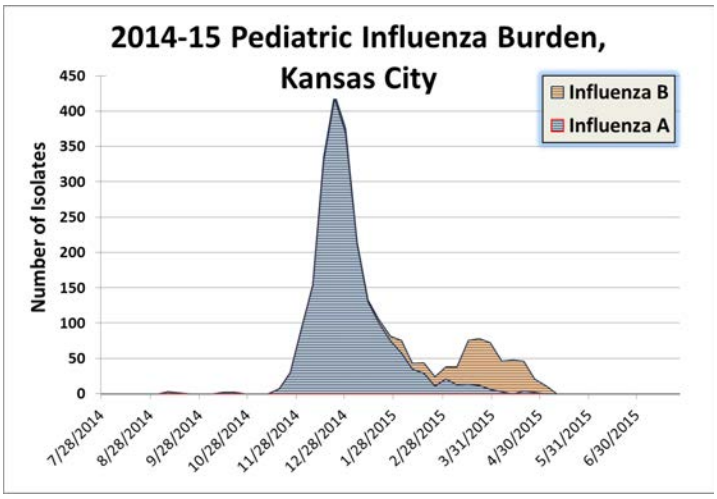
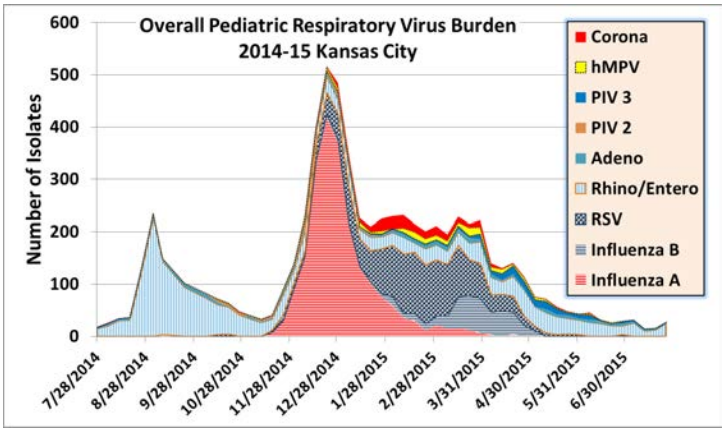


Figure 4



Continued on Page 21

ID Pearls and Other Gems: Molecular Diagnostics . . . *Continued from Page 20*

Clinicians are accustomed to viral seasonality in most temperate climates. After practicing for a few years, clinicians can often predict the month of the year by monitoring the respiratory diagnoses for a few days.

For example, deep summer and early autumn brings enterovirus (Figure 1), which can present in various forms depending on the serotype and on host factors. Coxsackie A viruses are associated with hand-foot-and-mouth disease or herpangina, while other enteroviruses present as aseptic meningitis or nonspecific highly febrile illnesses. In the case of EV-D68, there was an outbreak in Kansas City during the summer 2014 (Figure 2) of severe respiratory syndromes requiring PICU care particularly in asthma-prone children. Rhinovirus occurs all year long but has been described having higher prevalence in September through October. Rhinovirus most often causes nonspecific URI symptoms, but at times can produce lower respiratory illnesses.

Of interest, both rhino- and enteroviruses shed for weeks to months after initial acquisition, often long after symptoms due to the virus are gone. They often contribute to multi-virus detections. This makes us cautious in attributing any given symptoms to these species unless the rhino- or enterovirus is a sole detected pathogen during a recent onset illness. Also consider that there are more than 60 serotypes of enteroviruses and over 100 serotypes of rhinoviruses. This means that repeated molecular detections of either rhino- or enterovirus do not tell us whether the test detected a persistently shed strain from a distant acquisition or a new recently acquired strain, because current clinical laboratory testing methods do not indicate the serotype. So ascribing new current symptoms to either rhino- or enterovirus can be challenging.

As peak seasons for enterovirus (summer-fall) and rhinovirus (early autumn) decline, parainfluenza virus usually appears in early to mid-autumn (Figure 2), causing URIs and croup, and to a lesser extent bronchiolitis or bronchopneumonia. With winter's onset in December comes influenza A (Figure 3) with its classic sudden onset presentation of fever, headache, sore throat, cough and myalgias. Influenza A usually peaks in January but is joined by RSV with bronchiolitis as its main presentation (Figure 1). Then, as influenza A begins to wane, influenza B often increases in prevalence in late February or March (Figure 3). As influenza and RSV wane, parainfluenza reappears causing croup again (Figure 2). Then a period of relative virus "calm" begins, when adenovirus is the main respiratory virus, at its baseline year round steady rate, with occasional regional outbreaks of conjunctivitis with or without pharyngo-tonsillitis.

Seasonality of "Newer" Viruses. So what about those other "new" viruses we are hearing about, e.g., coronaviruses or even the newest first detected 10 years ago, bocavirus? With the advent of molecular technologies capable of detecting a dozen or more viruses from a single respiratory specimen, we can identify "newer" viruses causing frequent URIs.[4]

Coronaviruses. The prevalence of coronaviruses, at least the types detected in the assay used at our institution (HKU1, NL63, 229E, and OC43), appears to parallel influenza, with highest prevalence in deep winter/spring (Figure 2, 3 and 4). Modest URI syndromes appear to be associated with coronavirus, but a proportion of coronaviruses are also co-isolates with other viruses and may not be the primary pathogen. Coronaviruses appear clinically similar to rhinovirus except for fewer serotypes and a peak somewhat later in respiratory season.

Human bocavirus. Routine clinical laboratory testing at my hospital does not detect human boca virus 1 (HBoV-1) epidemiology. But a recent study performed in Seattle adds clarity to HBoV-1[5] by analyzing specimens collected previously in a prospective study of HHV6 epidemiology. These authors sought to define HBoV-1 shedding and illness in 87 children followed at least 18 months from birth. HBoV-1 was detected in ¾ of the children and HBoV-1 was continually detected for more than 1 month in 2/3 of them. One child shed for 402 days. When first acquiring HBoV-1, children were almost 3 times as likely to have both a new onset cough and a medical care visit. Half of the children ceased shedding and then again had HBoV-1 detected later. One striking finding was that multiple genetic variants differing from the original HBoV-1 strain were detected during almost 20% of recurrent HBoV-1 episodes.

Take home message. For most viral URIs, there is no specific antiviral treatment. For those for which antiviral treatment is available, e.g., influenza, only select patients qualify for antivirals per CDC recommendations. So, is there a need to know specifically what virus causes URIs? From an everyday clinical need, the answer is no. But, it can be gratifying to give parents some idea on what is causing their child's illness. Even without actual testing, but based on knowledge gleaned

Continued on Page 22

ID Pearls and Other Gems: Molecular Diagnostics . . . *Continued from Page 21*

from the child's particular clinical presentation (e.g., croup for parainfluenza vs nonspecific URI for rhinovirus) and the time of the year, we can usually make a reasonably good educated guess. Parents seem to appreciate hearing that the current respiratory illness is most likely rhinovirus or that the croup is most likely parainfluenza virus.

And in those instances when parents consider that "too many" respiratory infections may indicate an immune deficiency, the expense of testing a few of the URIs to show that there is a specific pathogen (up to 75% of multiplex PCR tests reveal a potential pathogen) might reduce anxiety in the family and pressures to "test the immune system".

Respiratory Virus Colonization? Finally, multiplex respiratory sample testing often gives unexpected results, e.g. multiple viruses are detected. So which if any of the detected viruses are a real pathogen? In other words, can children be "colonized" with viruses like they are with bacteria in the respiratory tract? The short answer is yes. As noted above, rhinovirus, enterovirus and now we know that HBoV-1 are shed for weeks to months after first acquisition while producing symptoms for only the first week or so. Most other respiratory viruses are shed for only 1-2 weeks, with the youngest children shedding the longest. So if you see results indicating detection of multiple viruses and one is rhino/enterovirus, consider that the rhino/enterovirus is present but is not producing the symptoms.

A recent Texas study of 368 infants making over 2,000 medical visits in their first year of life showed that children with what the authors called "asymptomatic infection" have lower viral loads than those with acute symptomatic infections.[6] Of interest, 76% of URI specimens were positive for at least one virus while only 27% of specimens from asymptomatic monthly specimens were positive. They did not check for HBoV-1. Given the Seattle data, the percent positives would likely have been 85% in symptomatic and 35% in asymptomatic patients if HBoV-1 had been sought. Regardless, symptomatic URI patients have 3 times the rate of viral detection at log10 higher quantities.

Such information is helpful for us to understand that the mere presence of a virus in respiratory secretions is not proof it is the cause of respiratory symptom. There appear to be differences in the significance of different viral detections based on quantitation, but currently we have no practical way to know relative viral loads. A CDC-sponsored multi-center national study is planned for the coming year to further refine testing for respiratory viruses and their interpretation. Stay tuned.

Getting back to our frequent URI child, consider the potential burden of viral exposures to which children are exposed (Figure 4). It is no wonder that children who attend day care or who have multiple siblings are exposed to 10 or more virus strains per year, and that they are symptomatic so many days in their first years when their immune repertoire is still developing.

References:

1. The National Institute of Child Health and Human Development Early Child Care Research Network. Child Care and Common Communicable Illnesses: Results From the National Institute of Child Health and Human Development Study of Early Child Care. Arch Pediatr Adolesc Med. 2001;155(4):481-488. doi:10.1001/archpedi.155.4.481.
2. Alter SJ, Bennett JS, Koranyi K, Kreppel A, Simon R Common childhood viral infections. Curr Probl Pediatr Adolesc Health Care. 2015 Feb;45(2):21-53. doi: 10.1016/j.cppeds.2014.12.001. Epub 2015 Feb 20.
3. Kusel MMH, H. de Klerk NH, Holt PG, Kebadze T, Johnston SL and Sly PD. Role of Respiratory Viruses in Acute Upper and Lower Respiratory Tract Illness in the First Year of Life A Birth Cohort Study. Pediatr Infect Dis J 2006;25: 680–686).
4. Chonmaitree T, Revai K, Grady JJ, Clos A, Patel JA, Nair S, Fan J, and Henrickson KJ. Viral Upper Respiratory Tract Infection and Otitis Media Complication in Young Children. Clin Infect Dis. (2008) 46 (6): 815-823. doi: 10.1086/528685.
5. Martin ET, Kuypers J, McRoberts JP, Englund JA, and Zerr DM. Human Bocavirus 1 Primary Infection and Shedding in Infants . J Infect Dis 2015;212:516–24.
6. Chonmaitree T, Fernandez PA, Jennings K, Trujillo R, Marom T, Loeffelholz MJ, Miller AL, McCormick DP, Patel JA, and Pyles RB. Symptomatic and Asymptomatic Respiratory Viral Infections in the First Year of Life: Association With Acute Otitis Media Development. Clin Infect Dis. (2015) 60 (1): 1-9. doi: 10.1093/cid/ciu714.

Chapter Corner:

Nebraska Chapter – Ebola Preparedness in Pediatrics: Where are we now?

Kari Simonsen, MD, FAAP, FPIDS,
Chief, Division of Pediatric Infectious Diseases University of Nebraska Medical Center, Omaha, NE

It's been nearly a year[1] since the Ebola epidemic gripped the attention of the U.S. public and lay media with the report of a domestically identified Ebola case; much has been done to prepare our hospitals in the US and abroad since that time. Let's consider just how far have we come, and what is being done to sustain our readiness for future epidemics and emerging infections?

West Africa Ebola Epidemic Status Update

The West Africa Ebola Virus Disease (EVD) epidemic is the largest in world history, and the numbers are truly sobering: to date, there have been 27,948 suspected, probable, and confirmed cases (August 14, 2015 CDC/WHO), and over 11,000 deaths. Sierra Leone, Guinea, and Liberia have been hardest hit, but 7 additional countries both neighboring and abroad have reported cases, including the U.S. This epidemic has been instrumental in the decision to create lasting change in how the CDC, WHO, MSF, and other global health partners respond to emerging infectious diseases and outbreaks. Important among these efforts includes rapidly mobilizing clinical trials capability, which has led to the recent exciting news that a vaccine candidate (rVSV-ZEBOV, Merck Sharp and Dohme, Kenilworth, NJ, USA)[2] is efficacious in clinical trial settings and may be effective in Ebola outbreak scenarios when used in a ring-vaccination strategy to protect contacts when the disease is diagnosed in an index patient.

A National System for Ebola Preparedness

The CDC has developed a tiered approach to national preparedness for EVD with hospitals being designated as:

1) Frontline Centers—able to identify a patient with epidemiological and clinical signs of EVD, isolate the patient appropriately, and inform public health authorities for discussion of transfer to a higher level of care
2) Ebola Assessment Centers—able to evaluate and test a patient for possible EVD and facilitate transfer to a treatment center if EVD is confirmed
3) Ebola Treatment Centers—able to care for Ebola patients for the duration of their illness

A network of nine regional Ebola treatment centers (with a tenth to be named) has been designated to facilitate U.S. expertise in caring for EVD patients. Each of these regional treatment centers must be able to care for a pediatric EVD patient, or have a pediatric partnership able to provide care for children. Additionally, a current total of 55 Ebola Treatment Centers have prepared and been designated as hospitals that can provide geographic coverage of the major cities, international gateways, and locations where returned travelers who may be infected with EVD would enter the country.

Sustaining our Efforts

In order to sustain these efforts to keep U.S. hospitals ready to identify, isolate, transfer, and treat Ebola patients—and other emerging infectious disease threats, the U.S. DHHS has implemented a National Ebola Training and Education Center (NETEC) approach. This collaboration is led by the DHHS Assistant Secretary for Preparedness and Response and the CDC, and includes three academic health centers with experience in caring for EVD patients in the U.S.: Emory University in Atlanta, GA, University of Nebraska Medical Center/Nebraska Medicine in Omaha, NE, and Bellevue Hospital Center in New York City. The NETEC will provide assessments of readiness and continuing education for the regional and state partners to facilitate clinical staff preparedness and training to safely treat patients with Ebola and other infectious diseases.

Enormous strides have been made in improving our capacity to identify and manage Ebola patients in the U.S. over the

Continued on Page 24

Chapter Corner: . . . *Continued from Page 23*

past year. This has been accomplished through the dedication of physicians, nurses and staff, healthcare systems, and public health personnel across the country and at every level. Innumerable hours and significant resources have been directed toward preparedness and training in individual centers. These efforts were led and championed by local teams and required involvement from every level of the healthcare system for success. This has been an extraordinary effort of teamwork and support and has brought us to a new level of preparedness as a nation.

In the past year, we have also shifted from individual systems working independently to sustain readiness, to a national network of training and treatment centers with the capacity to direct future preparedness and training efforts. Even when this outbreak of Ebola is contained, other emerging infectious disease threats will arise and require a national, enduring, systemic approach to preparedness in the US.

As pediatricians, we will continue to lead efforts for pediatric preparedness for Ebola and other emerging pathogens, and our knowledge and skills will continue to grow as we all work together. For questions about this article, please contact kasimonsen@unmc.edu

1. First US case diagnosed in Dallas, TX on September 30, 2014
2. Lancet July 31, 2015 http://dx.doi.org/10.1016/ S0140-6736(15)61117-5

Additional Resources:
AAP Children & Disaster's Webpage on the Ebola Outbreak
2015 Red Book: Hemorrhagic Fevers Caused by Filoviruses: Ebola and Marburg

New York Chapter 1 - Vaccine Refusal for Religious Reasons Leads to Discrimination Complaints Against Upstate NY Pediatric Clinics

Carolyn Cleary MD, FAAP, President and
Joseph Domachowske MD, FAAP, Secretary, New York Chapter 1

In early 2015, the mother of two boys filed a human rights complaint against at least 7 pediatric primary care practices in Rochester, New York on grounds of alleged religious discrimination. The mother had called several practices and challenged the offices about their policies on vaccine refusers. Several of the practices had policies which stated that they encouraged all patients to get vaccinated and for those patients who completely refused all vaccines, they felt they were not a good patient-doctor match and probably would not do well joining that practice. Nancy Adams, MSM, Executive Director for AAP District II, Chapter 1, and the Executive Director of the Monroe County Medical Society, supported the practices in their defense.

Ms Adams told the Rochester Democrat and Chronicle, that "(D)octors have to practice evidence-based medicine. When it comes down to it, you need to get your health care from someone that shares your wishes and beliefs, and we feel doctors have the right to not accept patients that don't want to follow the evidence-based recommendations."

Ultimately, the New York State Division of Human Rights dismissed the complaints and found that no discrimination had taken place. The person responsible for the complaints was never a patient of the practices named, but had the Division found merit in any of the complaints, the physicians could have faced disciplinary action from the state.

Due to recent outbreaks of vaccine preventable infections, more practices are receiving requests and feedback from patients who do not want to join or remain in a practice that accepts vaccine refusers. Chapter 1 District 2 feels that

Continued on Page 25

Chapter Corner: . . . *Continued from Page 24*

allowing practices to refuse patients who will not accept medical recommendations is appropriate, ethical, and just. For those practices that choose to continue to treat families who refuse some or all vaccines, however, the AAP makes available its Refusal to Vaccinate form, available at https://www2.aap.org/immunization/pediatricians/pdf/refusaltovaccinate.pdf.

If you have questions regarding this article please contact Nancy Adams at nadams@mcms.org

Arizona Chapter: Increased Human Papillomavirus Vaccine Educational Outreach in Arizona, 2014

By Karen Lewis, MD, FAAP, Chapter Immunization Oversight, Arizona Chapter of the American Academy of Pediatrics

Arizona vaccine coverage in 13-17 year olds for pertussis vaccine (Tdap) and quadrivalent meningococcal vaccine (MCV4) is high at 84% and 87%, respectively, according to the 2013 National Immunization Survey. However, vaccine coverage for human papillomavirus (HPV) vaccine in Arizona adolescents is much lower. The numbers of female adolescents who have received one, two and three doses of HPV are 64%, 48% and 37% respectively, while for males the coverage is 44%, 34% and 20%.

With the assistance of a grant from the American Academy of Pediatrics (AAP), the Arizona chapter of the AAP (AzAAP) was able to increase messaging about HPV vaccination through state-wide HPV education to healthcare providers and distribution of HPV vaccination materials.

AzAAP worked with state and county health authorities and our state's immunization coalition to plan and implement half-day presentations in each of the three major metropolitan areas of Arizona: Phoenix, Tucson, and Flagstaff. Approximately 96 clinicians received education through these "You Are the Key to Teen Vaccines" presentations.

Presenters included county health officers, county public information officers, a gynecologic oncologist, a pharmacist, and the medical director of the Immunization Program Office of the Arizona Department of Health Services. Presentations covered the burden of disease caused by HPV infection, the suboptimal levels of HPV vaccination coverage in Arizona, statewide efforts to improve HPV vaccine coverage, and a detailed description of the HPV vaccine campaign of the Centers for Disease Control and Prevention (CDC).

Attendees learned the importance of a strong provider recommendation for vaccination, and how this could be achieved for HPV vaccine in a primary care setting. Question and answer sessions provided opportunities for community physicians to discuss challenges from anti-HPV vaccine parents. State and county health officials explained the purpose of creating a statewide messaging campaign to combat myths and the importance of primary care providers utilizing these same messages. Physicians were encouraged to engage with the media to help move exam room messaging to the community by television, radio, and social media feeds.

In addition to these presentations, AzAAP used other measures to provide educational materials to healthcare providers and office staff. At the AzAAP's annual conference, the state immunization coalition discussed the state-wide HPV vaccine campaign and provided HPV vaccine-related materials to approximately 180 attendees. The AzAAP website (http://azaap.org) added a banner promoting the CDC HPV vaccine initiative of "You Are the Key to Teen Vaccines" and provided links to state and CDC HPV vaccine resources. Finally, by partnering with the Arizona Academy of Family Physicians, AzAAP mailed CDC HPV vaccine materials to a total of 2,500 clinicians so that the educational materials could be distributed to patients and families.

Continued on Page 26

Chapter Corner: . . . *Continued from Page 25*

AzAAP looks forward to increasing adolescent HPV vaccine coverage in Arizona as a result of the above efforts as well as efforts by pediatric healthcare providers throughout the state. For additional questions regarding this information contact: Anne Stafford, Executive Director, AzAAP at Anne@azaap.org

Missouri Chapter: Mumps: A re-emerging infection of highly immunized adolescents and young adults

Christelle Ilboudo, MD, Division of Infectious Diseases, Department of Child Health
University of Missouri Health Care System, Columbia, Missouri

Mumps is a viral systemic disease that presents with a prodrome of nonspecific symptoms including low-grade fever, anorexia, myalgias and headaches. The majority of cases progress to parotitis, whereas a third of the cases remain subclinical, with vague respiratory complaints, or asymptomatic. Parotid gland swelling is often unilateral, but can be bilateral with erythema and edema of the Stensen's duct. By the end of the first week of illness, the parotid gland reaches its peak swelling with obstruction of the angle of mandible and severe pain. Trismus and discomfort with acidic foods are not uncommon. Submandibular and sublingual salivary glands can be involved in 10% of cases. Presternal pitting edema and tongue swelling can occur secondary to obstruction of lymphatic drainage. Fever usually resolves in the first 5 days and parotitis within 7-10 days. Extrasalivary gland manifestations have been reported in less than 10% of cases in the post-vaccine era outbreaks. The most common entities are epididymo-orchitis in postpubertal males, oophoritis in postpubertal females, high frequency deafness, pancreatitis, meningitis and, very rarely, encephalitis. In the most recent US outbreaks of 2006 and 2009-2010, the most common extrasalivary gland manifestation was orchitis in 7-10% of postpubertal males.[1 2] Meningitis, oophoritis, mastitis, deafness, pancreatitis, and encephalitis were reported in <1% of cases. There were no mumps-related deaths. An association between maternal mumps infection in the first trimester and spontaneous abortion was observed in a large prospective cohort study[3]. Reports of other congenital complications including low birthweight and congenital anomalies are controversial.

Mumps is caused by the mumps virus, an RNA virus in the *Paramyxoviridae* family. It is endemic throughout the world. Humans are the only natural hosts. The virus is transmitted via direct contact with respiratory tract secretions, droplet nuclei or fomites. The virus requires intimate contact for transmission. Infected individuals can shed the virus during the prodromal phase. However the highest viral loads are detected close to the onset of parotitis and tend to decrease rapidly afterwards. Transmission likely happens right before and through the first 5 days of parotitis.[4] The incubation period can vary from 12-25 days, but symptoms typically occur within 16-18 days after exposure. In the pre-vaccine era, the incidence was highest between January and May in children under the age of 10 years. Epidemics occurred every 2-5 years in close communities including the military during mobilization, prisons, boarding schools, ships and remote islands.

In 1967, the mumps vaccine was licensed. In 1977, this vaccine was recommended by the Advisory Committee on Immunization Practices (ACIP) for children over 12 months of age. Starting in 1989, children were receiving a two-dose series of the mumps vaccine with the combined measles, mumps and rubella (MMR) vaccine, but it was not until 2006 that the ACIP made an official recommendation for a two-dose mumps vaccine series. In the post-vaccine era, there was a significant decrease in the incidence of mumps from over 150,000 cases in 1968 to 2982 cases in 1985.[5] However, initial outbreaks in the late 1980s were noted because of the low uptake of the two-dose vaccine series in adolescents. Improved vaccine uptake led to a significant decrease to only 203 cases by 2003. There have been two large outbreaks since then, involving individuals who received the two-dose series. In 2006, there were 6584 cases in mostly 18-24 year-old college students across the country.1 Sixty-three percent of the reported cases had documented 2 doses of the vaccine. In 2009-2010, another large outbreak occurred in Orthodox Jewish communities in the state of New York. The index case was an 11 year old male who developed parotitis while at a summer camp in New York, after returning from a trip to the United Kingdom. He had received both vaccines as well. A total of 3502 cases were reported, of which 1648 were laboratory

Continued on Page 27

Chapter Corner: . . . *Continued from Page 26*

confirmed. Adolescent males aged 13-17 years were disproportionately affected (28% of the total cases) and most, 89% had documented two-dose vaccination status.[2] In 2011-2013 there were several small outbreaks on college campuses in California, Virginia and Maryland with limited spread.

The diagnosis of mumps is mostly clinical; however, confirmation with laboratory evaluation is often done. Diagnostic tests include isolation of the virus or detection of the virus nucleic acid by reverse transcriptase-polymerase chain reaction (RT-PCR) in specimens from Stensen's duct exudates, throat washings, saliva or spinal fluid. RT-PCR assays are readily available and therefore preferred over culture. Serologic evaluation with detection of mumps-specific immunoglobulin (Ig) M antibody or a four-fold increase between acute and convalescent IgG antibody titers can also be used. In the two most recent large outbreaks involving highly immunized populations, IgM antibodies were short lived and high acute IgG titers made convalescent titers less reliable. The IgG antibody titers are most useful in unvaccinated persons and a negative IgM titer in an immunized individual cannot rule out the disease.

Supportive care is the recommended course of treatment. Intravenous immunoglobulin (IVIG) is not beneficial. Immunization during outbreaks is recommended for susceptible individuals who are not completely immunized. Immunization, especially with a third vaccine dose has not been shown to prevent infection after exposure[6]. Infection control measures include standard and droplet isolation of hospitalized patients for 5 days after the onset of parotitis. Children should be excluded from school for the same duration of 5 days after the onset of parotitis. Exclusion of children without evidence of immunity who refuse immunization is recommended for 26 days after the onset of the last known case in epidemic situations.

The recent cluster of mumps cases associated with a large university in central Missouri is similar to recent clusters and epidemics in terms of patient demographics. Seven young adults presented to healthcare facilities within 5 days with parotitis. Five of them had laboratory confirmation through RT-PCR detection. All individuals involved had documented vaccines according to the ACIP recommended schedule.

Mumps is a re-emerging infectious disease. Although most recent cases are in highly immunized adolescents and young adults, it is possible that the loss of herd immunity with increasing unimmunized populations has contributed to the observed trend. Younger children who are more likely to be unimmunized can serve as reservoirs. While these children are more likely to present with mild disease, exposed adolescents and young adult, although immunized, seek medical attention with more severe symptoms. It is reassuring that highly immunized individuals rarely develop extra-salivary gland manifestations. However, the need for booster vaccine with the concern for waning immunity will need continued exploration. Until further recommendations from the ACIP, the need for a third dose of MMR in an outbreak situation continues to be determined on a case-by-case basis. For additional information regarding this article, please contact Dr. Ilboudo at ilboudoc@health.missouri.edu.

References:

1. Dayan GH, Quinlisk MP, Parker AA, et al. Recent resurgence of mumps in the United States. N Engl J Med 2008;**358**(15):1580-9.
2. Barskey AE, Schulte C, Rosen JB, et al. Mumps outbreak in Orthodox Jewish communities in the United States. N Engl J Med 2012;**367**(18):1704-13.
3. Siegel M, Fuerst HT, Peress NS. Comparative fetal mortality in maternal virus diseases. A prospective study on rubella, measles, mumps, chicken pox and hepatitis. N Engl J Med 1966;**274**(14):768-71.
4. Kutty PK, Kyaw MH, Dayan GH, et al. Guidance for isolation precautions for mumps in the United States: a review of the scientific basis for policy change. Clin Infect Dis 2010;**50**(12):1619-28.
5. Centers for Disease C. Mumps--United States, 1985-1988. MMWR Morb Mortal Wkly Rep
6. Nelson GE, Aguon A, Valencia E, et al. Epidemiology of a mumps outbreak in a highly vaccinated island population and use of a third dose of measles-mumps-rubella vaccine for outbreak control--Guam 2009 to 2010. Pediatr Infect Dis J

Continued on Page 28

Chapter Corner: . . . *Continued from Page 27*

2013;**32**(4):374-80.

Resources:

1. American Academy of Pediatrics. Mumps. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. Red Book: 2015 Report of the Committee on Infectious Diseases. 30th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2015:564-568.
2. Centers for Disease Control and Prevention. Manual for the surveillance of vaccine-preventable diseases. Centers for Disease Control and Prevention, Atlanta, GA, 2008, Chapter 9: Mumps (Oct 2012).

Spotlight on AAP International Affairs:

The partnership of the American Academy of Pediatrics (AAP) and the Colombian Pediatric Society (SCP) and its important role in our infectious issues and vaccines

The AAP Office of International Affairs (OIA) comprises of three major areas of focus: grants and programs, business development, and professional relationships. This feature focuses on key global health initiatives and international partnerships as it relates to infectious diseases.

Ana Cristina Marino, MD, Coordinator of the Vaccine and Infection Committees of the Colombian Pediatric Society (SCP), Past-President SCP

The Colombian Pediatric Society (SCP), which has been in operation for almost 100 years, is one of the oldest scientific associations in the country and in Latin America. In addition, it is one of the most highly organized societies within Latin America with almost 3,500 pediatric members. The SCP provides its members with an administrative and political organization that represents them before national and international organizations related to children's health and well-being.

In Colombia, infectious diseases are one of the primary causes of childhood mortality. Because of Colombia's geographic location, tropical infectious diseases are especially important. In light of this, our Association created and strengthened its Infection and Vaccine Committee. This committee comprises pediatricians and pediatric ID specialists whose primary duties include providing high-level scientific advice to the Ministry of Health and other government agencies. This group particularly focuses on the immunization program, with an emphasis on coverage and updates with new biologic products that correspond to the country's current health situation.

The Expanded Immunization Program (PAI) in Colombia is an initiative in which our Society has always participated and is currently the most complete within Latin America. It includes 21 vaccines, many of which have been introduced in an accelerated manner in the last five years.

SCP has three delegate members who are part of the National Committee for Immunization Practices (CNPI) (equivalent to the ACIP) which is a technical/scientific committee. In addition, other delegates participate, including those from medical companies working with infectious diseases, from the Ministry of Health, and from the Colombian government. These members provide updated and complete scientific evidence, actively participate by speaking and voting, and make

Continued on Page 29

Spotlight on AAP International Affairs: *Continued from Page 28*

decisions regarding the national plan for vaccines and the best biologic products possible.

New changes at the local and national level regarding the immunization plan pose a challenge for pediatricians and health workers in terms of awareness and education within the community. To address this challenge and as part of our social responsibility to the country, the SCP is organizing a series of scientific events that include relevant topics on infectious diseases and vaccines. These events will be held as part of the National Pediatric Conference, which is held every two years. Speakers of the highest quality will present attendees with up-to-date information on a variety of topics and continuing medical education.

Additional events being developed stem from a partnership with the Colombian Ministry of Health, including all-day workshops regarding vaccines in all of the country's regions. An example is the National Vaccine Symposium, which offers high quality continuing education, currently reaching more than 3,000 pediatricians, doctors, nurses and health workers in the vaccine area working with the Ministry of Health's auxiliary entities in the various national territories.

For all of these operations, directly or indirectly, we have heavily relied on support from the AAP, with which the SCP has worked for almost a decade, strengthening year after year. The AAP has kept its doors open to our Society, has provided scientific advice to the members of the Committee, and has participated in our continuing pediatric education events with pertinent speakers and major publications. Their support has validated our association in a way that in recognized by all Colombian pediatricians and those from neighboring countries who are attending our academic events in growing numbers.

We do not want to leave anyone out, but for the most recent 2015 National Conference, we would like to recognize the participation of Dr. Margaret Fisher and Dr. Marietta Vasquez and the heartfelt visit and assistance of Dr. Errol Alden as his last official task outside of the USA as Chief Executive Officer of the AAP. His plenary talk highlighted the strong relationship between the AAP and SCP as well as our accomplishments, both those already achieved and those we want to achieve in medical education and health for the children of our country.

As a result of the partnership with the AAP, the SCP acquired subscriptions to the Red Book Online at special prices. These were distributed free of charge to all pediatric members for their continued review and as an additional contribution to the shared objectives to foster virtual education for our associates.

As an ID committee and association, we also consider it to be very important to work with other scientific organizations on the international level. Currently we are part of the GREEN group (Pneumococcal Disease Expert Group) organized by the SLIPE (Latin American Organization for Pediatric Infectious Diseases), which is jointly analyzing the burden and the behavior of pneumococcal disease and different vaccine plans in various Latin American countries.

Given the importance of tropical diseases and once again highlighting that some tropical diseases, including dengue, are prevalent in our country, the SCP has begun supporting a work group for dengue, which includes not only pediatricians and infectious disease specialists, but also epidemiologists, health professionals, health economists, and members of the Ministry of Health. We hope that the results of this group's studies will culminate in a publication that provides knowledge about the different aspects of this disease to the national and international scientific community.

The relationship between the AAP's Department of International Child Health and SCP is an important one, and we hope that it will continue to grow and strengthen in the future as we work to provide the best health care for children. For additional information, please visit: http://scp.com.co/ or contact me via e-mail DOICH at: international@aap.org

New Policy/Guidelines

Andrea Sperduto, MD FAAP, Cleveland Clinic Foundation

Besides the individual web sites listed below, links to the AAP ID policies, IDSA policies and the CDC ID Recommendations and Reports are all available at the SOID website: http://www2.aap.org/sections/infectdis/policy.cfm

1. **AAP**
   a. Head Lice. *Pediatrics* 2015;135:e1355-e1365.
      i. Updates 2010 clinical report.
      ii. Clarifies current diagnosis and treatment protocols.
      iii Includes recommendations for schools.

See information and links regarding the policy statement, "Recommendations for Prevention and Control of Influenza in Children, 2015-2016" and the reaffirmed policy statement, "Recommendations for Mandatory Influenza Immunization of Health Care Personnel" on page 7.

2. **MMWR**
   a. Use of 9-Valent Human Papillomavirus (HPV) Vaccine: Updated HPV Vaccination, Recommendations of the Advisory Committee on Immunization Practices. *MMWR* March 27, 2015/64(11);300-304.
      i. Contains HPV 6, 11, 16 and 18 like (4vHPV).
      ii. Also contains HPV 31, 33, 45, 52 and 58.
      iii. Same age recommendations as for 4vHPV and 2vHPV.
      iv. ~64% of invasive HPV-associated cancers are attributable to HPV 16 and 18. 10% are attributable to the 5 additional types in 9vHPV. (14% for females and 4% for males).
      v. Immunogenicity and safety profiles are similar to 4vHPV.

   b. Updated Recommendations for the Use of Typhoid Vaccine- Advisory Committee on Immunization Practices, United States, 2015. *MMWR* March 27, 2015/64(11);305-308.
      i. Updates recommendations from 1994.
      ii. Currently there are 2 vaccines available in U.S.: 1) Vi capsular polysaccharide vaccine IM approved for adults and children aged ≥2 years; 2) oral live-attenuated vaccine (Ty21a) administered in 4 doses on alternating days over 1 week approved for adults and children aged ≥6 years.
      iii. Cannot give oral vaccine to immunocompromised or pregnant individuals or to those taking antibacterial drugs.

   c. Use of Serogroup B Meningococcal Vaccines in Persons Aged > 10 Years at Increased Risk for Serogroup B Meningococcal Disease: Recommendations of the Advisory Committee on Immunization Practices, 2015. *MMWR* June 12, 2015/64(22);608-612.
      i. FDA approval of 2 vaccines: 1) MenB-FHbp (Trumenba) a 3-dose series and 2) MenB-4C (Bexsero) a 2-dose series.
      ii. Both are approved in persons aged 10-25 years.
      iii. Both are approved for persons at increased risk (e.g. complement pathway deficiencies; functional and anatomic asplenia, sickle cell disease, etc.), microbiologists who work with the bacteria, and persons exposed during an outbreak situation.
      iv. They are not currently recommended for routine use in first-year college students living in residence halls, military recruits, or all adolescents. Recommendations will be considered separately by the ACIP for these groups in the future.

   d. Yellow Fever Vaccine Booster Doses: Recommendations of the Advisory Committee on Immunization Practices, 2015. *MMWR* June 19, 2015/64(23);647-650.
      i. A single primary dose of yellow fever vaccine provides long-lasting (potentially lifelong) protection and is adequate for most travelers.
      ii. At-risk laboratory personnel and certain travelers may require additional booster doses, which are detailed in the report.

Continued on Page 31

New Policy/Guidelines *Continued from Page 30*

e. Sexually Transmitted Diseases Treatment Guidelines, 2015. *MMWR* June 5, 2015/64(3);1-137.
   i. Updates 2010 guidelines
   ii. STD prevention and screening addressed.
   iii. Detection/diagnosis and treatment guidelines detailed.

f. Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices, United States, 2015–16 Influenza Season. *MMWR* August 7, 2015 / 64(30);818-825. Updated information for the 2015–16 season includes:
   i. Antigenic composition of U.S. seasonal influenza vaccines
   ii. Information on influenza vaccine products expected to be available for the 2015–16 season
   iii. An updated algorithm for determining the appropriate number of doses for children aged 6 months through 8 years
   iv. Recommendations for the use of live attenuated influenza vaccine (LAIV) and inactivated influenza vaccine (IIV) when either is available, including removal of the 2014–15 preferential recommendation for LAIV for healthy children aged 2 through 8 years.
   v. Information regarding topics related to influenza vaccination that are not addressed in this report is available in the 2013 ACIP seasonal influenza recommendations.

3. **HIV Guidelines**

Complete guidelines and information can be found at: http://aidsinfo.nih.gov/guidelines and are updated periodically.

a. Guidelines for the Use of Antiretroviral Agents in Pediatric HIV-1 infection.
   i. Updated March 5, 2015
   ii. The FDA approved AMPLICOR HIV-1 DNA test used to diagnose infants born to HIV-1-infected mothers since 1992 is no longer commercially available in the U.S. The sensitivity and specificity of non-commercial HIV-1 DNA tests may differ and caution is needed when using these tests.
   iii. Absolute CD4 cell counts should be used for monitoring immune status in children of all ages and CD4 percentage only used as an alternative.
   iv. Updates when to initiate therapy in antiretroviral-naive children to align more with adult and adolescent patients using absolute CD4 counts rather than percentage.
   v. Updates what drugs to use in antiretroviral-naive children.
   vi. New section on antiretroviral therapy for neonates.
   vii. Updated antiretroviral drug information including toxicities.

b. Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents.
   i. Updated April 8, 2015.
   ii. Significant changes in regimens for "treatment-naive" patients (now 5 recommended regimens).
   iii. Updates to sections on virologic failure, treatment of HIV-2-infected patients, and drug interactions.

SOID Leadership Roster

THE SECTION ON INFECTIOUS DISEASES • EXECUTIVE COMMITTEE

Tina Tan, MD, FAAP
Ann & Robert H. Lurie Children's Hospital of Chicago
Northwestern University Feinberg School of Medicine
Chicago, IL
Telephone: 312/227-4080
EM: titan@luriechildrens.org

Jane Carnazzo, MD, FAAP
Children's Physicians, Spring Valley
Omaha, NE
Phone: 402/955-7474
Cell: 402/630-4950
EM: jmcarnazzo@cox.net

Leonard R. Krilov, MD, FAAP
Children's Medical Center
Winthrop University Hospital
Mineola, NY
Telephone: 516/663-4600
or 516/663-9414
EM: lkrilov@winthrop.org

Lilly Immergluck, MD, MS, FAAP
Morehouse School of Medicine
Emory University Pediatric Infectious Disease Specialist with Children's Healthcare of Altanta (CHOA)
Atlanta, GA
Telephone: 404/756-1330
EM: Lilly.immergluck@choa.org
or limmergluck@msm.edu

Kenneth Zangwill, MD, FAAP
Harbor-UCLA Medical Center
David Geffen
School of Medicine at UCLA
Torrance, CA
Telephone: 310/781-3636
EM: kzangwill@labiomed.org

ID TRAINING FELLOW LIAISONS

Rana Hamdy, MD, FAAP
Children's Hospital of Philadelphia
Philadelphia, PA
Telephone: 443-406-6044.
EM: hamdyr@email.chop.edu

Ishminder Kaur, MD, FAAP
St. Christopher's Hospital for Children
Philadelphia, PA
Telephone: 215/427-5201
EM: ishminder.kaur@drexelmed.edu

NC&E PLANNING GROUP REPRESENTATIVE

Anne Rowley, MD, FAAP
EM: a-rowley@northwestern.edu

NOMINATIONS CHAIRPERSON

Dennis Murray, MD, FAAP
EM: dmurray@gru.edu

RBRVS CHAIRPERSON

Margaret Ikeda, MD, FAAP
EM: mkikeda@pol.net

WEBSITE CONTENT DIRECTOR

Lilly Immergluck, MD, FAAP
EM: **lilly.immergluck@choa.org**

NEWSLETTER CO-EDITORS

Jane M. Carnazzo, MD FAAP
EM: jmcarnazzo@cox.net
Jennifer S. Read, MD, MS, MPH, DTM&H, FAAP, FPIDS, FIDSA
EM: read@post.harvard.edu

NEWSLETTER EDITORIAL BOARD

Sherman Alter, MD, FAAP
EM: sherman.alter@wright.edu
Stephen Aronoff, MD, FAAP
EM: Stephen.Aronoff
@tuhs.temple.edu
Jane Gould, MD, FAAP
EM: Jane.Gould@DrexelMed.edu
Rana Hamdy, MD, FAAP
EM: rhamdy@gmail.com
Christopher J. Harrison, MD, FAAP
EM: cjharrison@cmh.edu
Ishminder Kaur, MD, FAAP
EM: ishminder.kaur@drexelmed.edu
Andrea Sperduto, MD, FAAP
EM: sperdua@ccf.org

EDUCATION/PROGRAM CHAIRPERSON

Ken Zangwill, MD, FAAP
EM: kzangwill@labiomed.org

EDUCATION SUBCOMMITTEE

Mayssa Abuali, MD, FAAP
EM: mayssa.abuali@gmail.com
Sherman Alter, MD, FAAP
EM: Sherman.alter@wright.edu
Robert Frenck, MD, FAAP
EM: Robert.Frenck@cchmc.org
Lilly Immergluck, MD, FAAP
EM: Lilly.immergluck@choa.org
Sabah Kalyoussef, MD, FAAP
EM: sbenz61@gmail.com
Jennifer Read, MD, MS, MPH, DTM&H, FAAP, FPIDS, FIDSA
EM: read@post.harvard.edu
Emily Souder, MD, FAAP
EM: emily.souder@drexelmed.edu
James Wilde, MD, FAAP
EM: jwilde@gru.edu
Zachary Willis, MD, FAAP
EM: zachary.i.willis@vanderbilt.edu
Charles Woods, MD, FAAP
EM: charles.woods@louisville.edu

AAP STAFF

Suzanne Kirkwood, MS
Manager, Section of Infectious Diseases
Phone: 800/433-9016, ext. 7648
Fax: 847/434-8000
EM: skirkwood@aap.org

Mark A. Krajecki
Prepress Production Specialist