ID Fellows

Our new fellow starting in July is Dr. Najmus Sahar. Dr. Sahar graduated from Dow Medical College in Pakistan in 2009. She works in Dayton, OH and completed residency training from the Wright State University Internal Medicine Residency Program in 2016. She is married to Dr. Asghar Ali, a hospitalist in MVH and mother of 3 children Fawad, Ebaad and Hammad. She spends most of her spare time with family in outdoor activities.

Dr Alpa Desai will be at Miami Valley Hospital in May and June, and at the VA Medical Center in July. Dr Luke Onuorah will be at the VA Medical Center in May and June, and at Miami Valley Hospital in July. Dr. Najmus Sahar will be at MVH in July.

Raccoon Rabies Immune Barrier Breach, Stark County

Two raccoons collected this year in Stark County have been confirmed by the Centers of Disease Control and Prevention to be infected with the raccoon rabies variant virus. These raccoons were collected outside the Oral Rabies Vaccination (ORV) zone and represent the first breach of the ORV zone since a 2004 breach in Lake County. In 1997, a new strain of raccoons was introduced into northeastern Ohio from Pennsylvania. The Ohio Department of Health and other partner agencies implemented a program to immunize wild raccoons for rabies using an oral rabies vaccine. This effort created a barrier of immune animals that reduced animal cases and prevented the spread of raccoon rabies into the rest of Ohio. The vaccine-laden baits are dropped by fixed wing aircraft or a low-flying helicopter in rural areas or distributed by hand and from vehicles in urban neighborhoods. Regular baiting occurs once a year from August to September in the eastern part of the state.

Lyme Disease in Ohio

In recent years, the Ohio Department of Health (ODH) provided information on increasing Lyme disease and the establishment of the principal vector, *Ixodes scapularis*, in Ohio. Cases continue to increase and in 2016 ODH reported 160 cases. As we head into spring/early summer and people spend more time outdoors, contact with ticks and the risk of contracting Lyme and other tick-borne diseases increases. ODH is asking local health care providers to ensure that all cases are detected. Additional information is available from the ODH Bureau of Infectious Diseases, Zoonotic Disease Program at 614-752-1029 (ask for the tick-borne disease epidemiologist, Lynn Denny); the email is zoonoses@odh.ohio.gov. In the past, the low occurrence of Lyme disease cases in Ohio was attributed to the absence of the tick vector, *Ixodes scapularis*, known as the blacklegged tick or deer tick. Since 2010, blacklegged tick populations in Ohio have increased dramatically, and their range continues to expand in the state, particularly in the forest habitats preferred by this tick. The latest maps of blacklegged ticks and incidence of Lyme Disease in Ohio are below:
Multistate Outbreak of Listeriosis Linked to Soft Raw Milk Cheese Made by Vulto Creamery

Six people infected with the outbreak strain of Listeria have been reported from Connecticut, Florida, New York and Vermont. Listeria specimens from ill people were collected from September 1, 2016 to January 22, 2017. All six people were hospitalized, and two people from Connecticut and Vermont died. One illness was reported in a newborn. Ill people ranged in age from less than one year to 89, with a median age of 55. Epidemiologic and laboratory evidence indicates that soft raw milk cheese made by Vulto Creamery of Walton, New York, is the likely source of this outbreak. Testing of samples of Ouleout cheese collected from Vulto Creamery by New York State Department of Agriculture and Markets identified the outbreak strain of *Listeria monocytogenes*. Vulto Creamery has now recalled all lots of the following cheeses: Heinennellie, Miranda, Willowemoc, Ouleout, Andes, Blue Blais, Hamden, and Walton Umber.

Multistate Outbreak of Shiga toxin-producing *Escherichia coli* O157:H7 Infections Linked to I.M. Healthy Brand SoyNut Butter:

Per CDC report, as of March 30, 2017, a total of 29 people infected with the outbreak strain of *E. coli* O157:H7 were reported from 12 states. The number of ill people identified in each state is as follows: Arizona (4), California (5), Florida (1), Illinois (1), Maryland (1), Massachusetts (1), Missouri (1), New Jersey (1), Oregon (9), Virginia (2), Washington (2), and Wisconsin (1). Twelve ill people have been hospitalized, and nine people developed hemolytic uremic syndrome (HUS), a potentially life-threatening type of kidney failure. Ill people range in age from 1 to 57 years. Twenty-four of the 29 illnesses were reported in children under the age of 18. No deaths have been reported. Illnesses started on dates ranging from January 4, 2017, to March 13, 2017. Epidemiologic and laboratory evidence indicates that I.M. Healthy brand SoyNut Butter is the likely source of this outbreak. I.M. Healthy brand SoyNut Butter may be contaminated with *E. coli* O157:H7 and could make people sick. This investigation is ongoing. All Best By dates of I.M. Healthy SoyNut Butters and I.M. Healthy Granola are included in the recall. CDC will provide updates as more information becomes available.

Human infection with avian influenza A (H7N9) virus – China

Human infections with an Asian lineage avian influenza A (H7N9) virus (“Asian H7N9”) were first reported in China in March 2013. Annual epidemics of sporadic human infections with Asian H7N9 viruses in China have been reported since that time. China is currently experiencing its 5th epidemic of Asian H7N9 human infections. This is the largest annual epidemic to date. As of May 1, 2017, the World Health Organization (WHO) has reported 623 human infections with Asian H7N9 virus during the 5th epidemic. To date, a total of 1421 laboratory-confirmed human infections with avian influenza A(H7N9) virus have been reported through IHR notification since early 2013. Most human infections with avian influenza viruses, including Asian H7N9 virus, have occurred after exposure to poultry; Asian H7N9 viruses continue to circulate in poultry in China. Most reported patients with H7N9 virus infection have had severe respiratory illness (e.g., pneumonia). Rare instances of limited person-to-person spread of this virus have been identified in China, but there is no evidence of sustained person-to-person spread. Asian H7N9 viruses have not been detected in people or birds in the United States.

Meningococcal meningitis outbreak in Nigeria

As at April 3, 2017, a total of 2,997 suspected cases of meningitis have been reported in 16 States in Nigeria, of which 146 have been laboratory-confirmed. Unfortunately, 336 deaths have also been
recorded. Outbreak started in December 2016. Neisseria meningitidis serotype C was the commonest cause of meningitis outbreak. The most affected age group is that made up of 5-14 year olds who have not experienced previous infections due to meningitis group C, making them particularly susceptible to this strain of the disease. A total of 500,000 doses of Meningitis C vaccines have been distributed to some of the affected States for immediate outbreak response vaccination. An additional 823,970 doses of Meningitis C vaccines are expected from the UK to support vaccination activities in other affected States. The number of new cases of suspected meningitis being reported has begun to decline as outbreak control measures take effect. A total of 628 new cases were reported in week 16 versus 1,935 in week 15 and 2,127 in week 14. The cumulative number of suspected cases recorded in Nigeria throughout the outbreak period is now 9,646 and 839 deaths from 43 Local Government Areas in 23 states.

EMERGING INFECTIONS NETWORK

EIN Query: Injection Drug Use and Infectious Disease Practice

The overall response rate was 672 of 1276 (53%). 61% of ID physician respondents reported seeing ≥1 patient per month with an infection related to injection drug use, most commonly skin and soft tissue infections (seen frequently by 61%), bacteremia/fungemia (53%), and endocarditis (50%). For infections typically managed with ≥2 weeks of parenteral therapy, the most frequently used management strategies were: managing the entire course on an inpatient unit (by 41%) and transfer to other supervised facility for completion of parenteral therapy (35%). Only 116 (22%) respondents reported that their hospitals provided a dedicated multi-disciplinary addiction service. These respondents were significantly more likely to agree/strongly agree that ID physicians should actively manage substance use disorders than were physicians whose facilities did not provide a dedicated service (54% vs 43%, p=0.03).

The full report is at: http://www.int-med.uiowa.edu/Research/EIN/FinalReport_IDUandID.pdf
A 51-year-old white man who had earlier been discharged 4 days prior for a draining, ondontogenic abscess, posterior to the right upper incisors that was treated with amoxicillin-clavulanic acid and dexamethasone; was readmitted with complaints of a two day history of dizziness, dyspnea, and passage of dark tarry stools. There was accompanying fever and chills. He agreed to NSAIDs use, and an improvement of his right facial swelling. He had no other chronic condition. He lived alone, drank 4 beers a week and used marijuana remotely.

Vital signs at admission: Tmax 100.2F; Blood pressure: 139/78 mmHg; Pulse rate: 100 beats per minute; Respiratory rate: 18 cycles per minute; pulse oximetry: 99% on room air. He was an obese man, in moderate distress, mildly toxic but answering questions appropriately. Physical examination notably revealed: poor dentition, swelling along the right mandible, without purulent drainage. Heart sounds were irregularly irregular, distant intermittently and pulsus paradoxus was present. Melena was present on rectal examination.

Laboratory data showed leukocytosis: 26,600/mm3, and anemia, hemoglobin 8.4 g/dL. EKG and Chest x-ray were consistent with pericardial effusion; and this confirmed with an urgent bedside echocardiogram that revealed a large pericardial effusion with tamponade physiology. An emergent fluoroscopic guided pericardiocentesis yielding 590 ml of exudative, straw-colored fluid was performed. Cultures were sent, and empiric intravenous ampicillin-sulbactam was administered. The day after, the patient complained of worsening productive cough, wheezing, and stridor. A CT of the neck and chest were done, revealing extensive abscess of involving the floor of the mouth and extending into the neck and mediastinum.
The ENT service drained the carotid sheath, submental, retropharyngeal and mediastinal abscess and four JP drains were left in place. The Cardiothoracic surgery service performed a Video assisted thorascopic surgery (VATS) for drainage of posterior mediastinal abscess and right pleural fluid. Complete dental extraction was also performed on him. Ertapenem was substituted for Ampicillin/Sulbactam. Blood cultures remained negative, however, abscess cultures first became positive six days later. The organisms isolated were a polymicrobial mix of anaerobic gram positive cocci and
bacilli; *Micromonas spp*, *Coagulase-negative Staphylococcus spp*; *Viridans group Streptococcus*. He was discharged home after 17 days to complete a 4-week course Ertapenem.

Final diagnosis: Lemierre’s syndrome from ondontogenic infection, extending into the neck, mediastinum complicated by purulent pericarditis.

**Discussion**

Lemierre’s syndrome (LS) is defined as a pharyngeal infection, complicated by septicemia and internal jugular vein thrombosis followed by septic emboli. It was first described in 1936 by the French bacteriologist: Andre-Alfred Lemierre (1). Indeed, it was a fatal disease before the advent of antibiotics, so much so, it’s re-emergence has caused some to call it the ‘forgotten’ disease. It is a disease that typically affects, adolescents and young adults with 70% of described cases occurring in the 16-25 age group. It occurs in about one per million people, with a mortality rate approximately 4-12 %. (2) *Fusobacterium necrophorum* is the major implicated bacteria, however, other oral commensal microbes may be involved as well. (3) Contrast enhanced CT is the modality of choice for an early diagnosis of LS. Treatment must be prompt; protection of the airway must be a priority. It will require aggressive surgical exploration and debridement. Antibiotics that provide anaerobic coverage such as ampicillin/sulbactam, ertapenem and moxifloxacin may be used. Clindamycin is also an option, but there concerns of microbial resistance are present. The use of anticoagulation remains controversial and decisions to anticoagulated should be made on a case by case basis. (4)

**References**

Review: FDA Approves first Cholera Vaccine in the US

Cholera is now rarely seen in the United States. Improvements in the chlorination, filtration and storage of sewage have reduced infection and spread of the bacteria, *Vibrio Cholera*. However, in countries where there is poor environmental management and over-crowding, Cholera is still prevalent and maintains its epidemic potential. In such areas, the profuse diarrhea and vomiting can cause death within hours of symptom onset without rehydration. American travel to at-risk areas makes prevention of Cholera an obvious interest to the United States. Treatment is currently available for Cholera. Options include Oral Rehydration Therapy, IV Fluids, and antibiotics. Although effective, the one antibiotic available is seldom used in treatment of Cholera: it does not decrease transmission, and there is a fear of bacterial resistance with overuse. Two vaccines are also available: in 1992, France manufactured a whole-cell killed Cholera vaccine, followed soon after by India’s own whole-cell killed vaccine, both oral. Neither vaccine is available in the USA. On June 10th, 2016, the US Food and Drug Administration (FDA) approved the first Cholera-preventing vaccine available in the United States. *Vaxchora* prevents cholera caused by serogroup 01, quoted by the World Health Organization as the “primary cause of cholera worldwide”. The vaccine is live, weakened and administered as a single, oral liquid dose (3 fluid oz). It is the only single-dosed Cholera preventing vaccine.

1. *Vaxchora* is approved in adults ages 18 through 64 traveling to cholera-affected regions.
2. Administer the vaccine at least 10 days before travel to a Cholera-affected region.
3. Although weakened, *Vaxchora* is a live vaccine and should be avoided by those who are pregnant or in an otherwise immunocompromised state.
4. In a US trial, *Vaxchora*’s efficacy was 90% among participants challenged 10 days after vaccination and 80% among participants challenged 3 months after vaccination.
5. The most frequently reported adverse reactions are fatigue, headache, abdominal pain, nausea and vomiting, anorexia, and diarrhea.

While *Vaxchora*’s efficacy has not been tested in those living in Cholera-affected regions, there have been multiple Randomized Control Trials (RCT) in the USA and in Australia. The goal of these RCTs was to determine vaccine response by measuring antibody production. In adults aged 18-45 years, 93% of vaccinated persons produced antibodies and in those aged 46-64 years, 90% produced antibodies. These studies provide confidence in *Vaxchora* for those looking for a quick and effective option for Cholera prevention.

References:
**Fosfomycin**

Fosfomycin is FDA-approved for uncomplicated urinary tract infections (UTIs) due to *E. coli* and *E. faecalis*. Off-label uses include treatment of complicated UTI without bacteremia as well as treatment for *VRE*, *P. aeruginosa*, ESBL-producing pathogens, and CRE pathogens. Formulations include oral fosfomycin tromethamine salt (which is a newer, less toxic form), as well as intravenous fosfomycin disodium which is not available in the U.S. Typical dosing schemes include fosfomycin 3 gram sachet by mouth one time only with or without food for uncomplicated UTI; for complicated UTI, dosing is every 2 to 3 days for up to 21 days, on an empty stomach. The sachet powder is mixed with 120mL of cool water until dissolved. Renal dosing adjustments can be considered at GFR levels 10-50mL/min, and should likely be adjusted at GFR <10mL/min. For hemodialysis patients, re-dosing after dialysis is recommended. The most common adverse effects include gastrointestinal intolerances such as diarrhea, nausea, and dyspepsia. The spectrum of activity is extremely broad, and includes many aerobic gram-negative bacilli and aerobic gram-positive cocci: *E. coli*, *Enterococcus* (including vancomycin-resistant forms), *Pseudomonas*, *S. aureus* (including MRSA), *Klebsiella spp.*, *Proteus*, *Citrobacter spp.*, *Enterobacter aerogenes*, and *Serratia marcescens*. Fosfomycin interferes with bacterial cell wall synthesis by inhibiting the enzyme enolpyruvyl transferase (this enzyme normally catalyzes the first step in bacterial cell wall synthesis). Fosfomycin is 37% absorbed without food (30% with food), and primarily excreted in the urine. The half-life is 5.7 hours, and it is distributed in the bladder wall, kidney, prostate, and seminal vesicles. This antibiotic remains an alternative option for pregnant women, as it is pregnancy category B. The primary limitation of the drug is the lack of systemic absorption, and therefore should not be used in severe pyelonephritis and sepsis. Still, fosfomycin is an option that may be considered in the setting of multi-drug resistant pathogens, or multiple antibiotic allergies, where there may be limited options.
Bug of the Quarter
By: W. Grant Starrett, M.D.

This article reviews the more obscure organisms which are less commonly isolated in clinical specimens. Please contact me at wgstarrett@premierhealth.com if you come across an isolate that may fit in this category.

Organism: Rothia

Clinical Data: A 76-year-old male with history of Waldenstrom's macroglobulinemia, chronic left prosthetic knee infection and coronary artery disease presented to the hospital with neutropenic fever two days following bilateral inguinal hernia repair. He was subsequently diagnosed with acute lymphocytic leukemia and was initiated on modified hyper CVAD chemotherapy. The patient was well known to the infectious disease service for treatment of a chronic left prosthetic knee infection that was initially diagnosed five years prior. He eventually underwent fusion of the knee three years prior and had since been doing well on suppressive doxycycline. Three weeks into admission he developed chills while receiving chemotherapy, and blood cultures were obtained. Rothia species grew in both sets of blood cultures and Enterococcus faecium in one of two sets. Both isolates also grew in fungal blood cultures obtained the same day. His PICC line was removed, and a CT of the abdomen and pelvis was essentially unremarkable. The patient was treated with vancomycin, and subsequent blood cultures were negative. He was maintained on multiple prophylactic antimicrobials during his chemotherapy for three more weeks but developed diplopia and a HA. An MRI demonstrated an enhancing left caudate nucleus lesion, and initial non-invasive work-up for opportunistic pathogens was negative. The patient elected to be transferred to inpatient hospice, and he died six days later.

Taxonomy
Division: Bacteria
Phylum: Actinobacteria
Subclass: Actinobacteridae
Order: Actinomycetales
Family: Micrococcaceae
Genus: Rothia

Associated Diseases:
1. Odontogenic infections
2. Line sepsis/bacteremia/endocarditis
3. Vertebral osteomyelitis
4. Deep abscesses
5. Pneumonia
6. CAPD peritonitis

Description:
Rothia species are fermentative, gram-positive coccobacilli which are infrequently identified in clinical specimens. The coryneform Rothia dentocariosa is a colonizer of the mouth and has occasionally been misidentified as Actinomyces. It was originally the sole species in this genus prior to changes made based on further genotypic and biochemical studies. Rothia mucilaginosa (formerly Stomatococcus mucilaginosus) is an encapsulated gram-positive coccus generally found in the oropharynx, and its colonies are gummy and adherent to the agar surface. This organism, in particular, has caused infection associated with malignancy, including leukemia patients with neutropenia. As common colonizers of the upper GI tract with some degree of pathogenicity, these organisms occasionally cause serious
opportunistic infections including endocarditis with paravalvular abscess and spine infection. They are usually beta-lactam susceptible but acquisition of the beta-lactamase plasmid can occur, and vancomycin is effective for virtually all infections.

**Resources:**
# Upcoming Events

## May 2017
- 10 Journal Club
- 31 Case Conference

## June 2017
- 16-18 Refugee Health Conference  
  Toronto, Canada
- 16-20 ASM Microbe (ASM/ICAAC)  
  [http://asmmicrobe.org](http://asmmicrobe.org)  
  Boston, MA

## July 2017
- 12 Journal Club
- 26 Case Conference

## August 2017
- 9 Journal Club
- 30 Case Conference

## September 2017
- 13 Journal Club
- 27 Case Conference

## October 2017
- 4-8 ID Week  
  San Diego, CA
- 11 Journal Club
- 25 Case Conference

## November 2017
- 8 Journal Club  
  Case Conference (TBA)
  MVH 6NW
  MVH Maxon Parlor

## December 2017
- 13 Journal Club  
  Case Conference (TBA)
  MVH 6NW
  MVH Maxon Parlor