

# Infectious Disease [ALERT]

Incisive Commentary and Clinical Abstracts on Current Issues in Infectious Diseases

## ABSTRACT & COMMENTARY

### Avoid real World Cup Fever: Prevention of Communicable Disease while visiting Brazil

*Vector-borne diseases, such as malaria, may be acquired in parts of Brazil*

*By Philip R. Fischer, MD, DTM&H and Peter J. Holmberg, MD*

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Drs. Fischer and Holmberg report no financial relationships in this field of study.

**SOURCE:** Iliaki E, et al. Travel to Brazil: Analysis of Data from the Boston Area Travel Medicine Network (BATMN) and Relevance to Travelers Attending World Cup and Olympics. *J Travel Med* 2014;21(3):214-217

**T**he 2014 FIFA World Cup and 2016 Summer Olympics will take place in Brazil and likely attract upwards of 600,000 international visitors each.<sup>1</sup> While many gains have been made in the reduction of communicable diseases in this Latin American country, infectious diseases still pose a great challenge in many areas of Brazil. Malaria cases have decreased overall, but the annual incidence of dengue has increased over the last two decades, and transmission areas of yellow fever also have grown larger. Much of the morbidity and even mortality due to the infectious diseases found in Brazil are either

vaccine-preventable or reduced by avoidance of mosquitoes, use of insect repellent, and/or the use of prophylactic medication.

The Boston Area Travel Medicine Network (BATMN), consisting of five travel clinics in the Boston area, reviewed 599 travelers who had destinations that included Brazil. A total of 85% received prescriptions for self-treatment of traveler's diarrhea, and 39% received anti-malarial prophylaxis. Yellow fever and typhoid were the most commonly administered pre-travel vaccinations at 71% and 58% respectively. A

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[INSIDE]

Measles — It's back again, as vaccine refuse niks travel to endemic areas page 112

PrEP for HIV page 113

Despite glove use, HCWs caring for *C.diff* patients get spores on hands page 115

Pubic lice, so '70s man page 119

# Infectious Disease [ALERT]

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total of 50% of travelers received Hepatitis A vaccination (and another 39% had previously received this vaccine) with 14% receiving influenza vaccination and 11% obtaining Hepatitis B pre-travel immunization. The most common risk prevention topics included vector-borne disease avoidance and fresh water exposure at 98% and 96%.

Brazil is a country with several vector-borne infection transmission zones, making initial pre-travel guidance difficult. Malaria — especially *Plasmodium vivax* but also some *P. falciparum* — is a disease with continued prevalence in Brazil, particularly in the Amazon region. However, most of the common areas of travel are without significant risk of transmission. Chemoprophylaxis is indicated for travelers whose itineraries include malaria-endemic parts of the country. Brazil has large regions that are yellow-fever endemic and pre-travel vaccination is indicated for all visitors except those visiting only eastern coast areas. Dengue fever is transmitted year-round via the vector mosquitoes *Aedes aegypti* and *Aedes albopictus* and precautions should be taken against mosquitoes, including avoidance and the use of insect repellants. Furthermore, typhoid fever is present but much less common in Brazil and immunization may be indicated. While influenza remains the most common vaccine-preventable disease in travelers, most of the visitors to Brazil did not obtain the vaccine. However, the 2016 Olympics will coincide with peak influenza circulation.

## ■ COMMENTARY

Brazil is a culturally and environmentally diverse nation with significant natural beauty and resources. It has been selected as the host nation for the 2014 FIFA World Cup and the 2016 Summer Olympics/Paralympics and will undergo significant transformation in anticipation of over 1 million combined visitors to these two events. While communicable diseases remain one of the most significant causes of morbidity and mortality in visitors to Latin America, and particularly Brazil, the majority of infectious illnesses can be prevented with pre-travel vaccination or avoidance of vector-borne insects and

appropriate repellants. As such, the Latin American Society for Travel Medicine (SLAMVI) has set forth guidelines for those traveling to Brazil.<sup>1</sup>

Given the prevalence of vector-borne illnesses including malaria, yellow fever, dengue, leishmaniasis, chikungunya, and Chagas disease, among others, education regarding the avoidance of mosquitoes and other insects (i.e., sandflies and Triatominae or “kissing bugs”) is essential for those traveling to Brazil.<sup>1</sup> While cases of malaria have been reduced dramatically since 2005, there were still almost 250,000 reported cases in Brazil in 2012.<sup>1</sup> The majority of malaria in Brazil is due to *Plasmodium vivax* transmitted via the *Anopheles* mosquitoes; visitors to high-risk areas may need chemoprophylaxis depending on time of year. The second most prevalent vector borne-illness, yellow fever, is largely preventable with vaccination. Travelers to parts of the country where yellow fever is endemic should receive the immunization. Of concern recently has been the arrival of chikungunya virus, with the first case in Rio de Janeiro noted in 2010.<sup>2</sup> Chikungunya is an arbovirus of the *Alphavirus* genus and has the same vector as dengue, the mosquito *Aedes aegypti*.<sup>2</sup> The lack of vaccination and medication for dengue and chikungunya infections underscores the importance of mosquito avoidance measures, including screens, bednets, and insect repellants.

A 2013 review compared the efficacy of different types of repellent against several types of insects including *Aedes*, *Anopheles*, and *Culex* mosquitoes as well as *Ixode*.<sup>3</sup> In regards to travel to Brazil, the most important insects are *Aedes* and *Anopheles*. *Ae. aegypti* was overall more difficult to repel than was *Ae. albopictus*. Regardless of species, *Aedes* mosquitoes were most effectively repelled with a DEET concentration of 20% or more. The 20% DEET was superior to other repellents, including IR3535, icaridin and citriodora. The profiles for the four repellents were similar in terms of repellency of *Anopheles* species.<sup>3</sup> Insect repellents with high concentrations of DEET are also effective for the prevention of transmission of infections via sandflies.<sup>4</sup>

While Brazil is preparing for a massive

influx of visitors, we must also prepare our patients before they travel. Pre-travel vaccinations for yellow fever, influenza, and hepatitis A as well as insect-avoidance measures including use of air conditioning, nets and insect repellants with 20% DEET, are important considerations for travelers to Brazil.

#### References

1. Gallego V, et al. The 2014 FIFA World Cup: Communicable disease risks and advice for visitors to Brazil - A review from the Latin American Society for Travel Medicine (SLAMVI). *Travel Med Infect Dis* 2014;S1477-8939(14)00078-7.
2. Albuquerque I, et. al. Chikungunya virus infection: report of the first case diagnosed in Rio de Janeiro, Brazil. *Rev Soc Bras Med Trop* 2012;45(1):128-129.
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## ABSTRACT & COMMENTARY

# Protocol-directed Care does not lead to improved Outcomes in early Septic Shock

By *Richard R. Watkins, MD, MS, FACP*

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Dr. Watkins reports no financial relationships in this field of study.

**SYNOPSIS:** A large, multicenter clinical trial that compared protocol-based care to usual care for patients presenting to emergency departments with early sepsis and septic shock found no differences in clinical outcomes. However, early recognition and therapy was beneficial and should be the standard of care.

**SOURCE:** The ProCESS Investigators. A randomized trial of protocol-based care for early septic shock. *N Engl J Med* 2014;370(18):1683-93.

Despite recent improvement, the short-term mortality in patients presenting to emergency departments with early sepsis and septic shock remains unacceptably high, i.e. approximately 20% in the USA. Researchers have tried a variety of interventions to improve outcomes in sepsis and septic shock, one of which is early goal-directed therapy (EGDT). First described in 2001, this paradigm involves a set protocol by which central venous catheterization is used to guide volume resuscitation and vasopressor titration.<sup>1</sup> Because of changes that have occurred in management of septic shock such as the less frequent use of central catheters (due to data showing no improvement in outcomes), the ProCESS investigators sought to determine whether protocol-based resuscitation was better than usual care and whether protocol-based resuscitation with central catheter monitoring was superior to a simpler protocol that did not include central catheter monitoring.

The study was a multicenter, randomized clinical trial conducted at 31 hospitals in the United States between March 2008 and May 2013. Subjects were those who presented to an emergency department at a participating site with a suspected diagnosis of sepsis,

were at least 18 years of age, had two or more criteria for systemic inflammatory response syndrome (SIRS), and had refractory hypotension or a serum lactate  $\geq 4$  mmol per liter. Overall, 1,341 patients were enrolled and assigned in a 1:1:1 ratio to the following groups: protocol based EGDT wherein a central venous catheter was used to monitor pressure and fluids (439 patients); protocol-based standard therapy that used a team approach with a set of 6-hour resuscitation instructions (446 patients); and usual care in which bedside physicians directed all medical therapy (456 patients). The primary outcome of the study was the rate of in-hospital death from any cause at 60 days. Secondary outcomes included mortality at 90 days and 1 year, duration of the need for vasopressors, duration of acute respiratory failure (defined as time spent on a ventilator), duration of acute renal failure (defined as the duration of dialysis), duration of stay in the intensive care unit and hospital, and disposition at hospital discharge.

The use of IV fluids, vasopressors, dobutamine and blood transfusions between 6 and 72 hours did not differ significantly between the groups. By 6 hours the target mean arterial pressure of 65 mm Hg or

greater had been achieved in more patients in the two protocol-based groups compared to the usual care group ( $P = 0.02$ ). The 60-day in-hospital death rate did not differ significantly between any of the three groups ( $P$  values between 0.31 and 0.89) and there were no significant differences in 90-day mortality or time to death up to 90 days and 1 year. The incidence of acute renal failure was higher in the protocol-based standard therapy group compared to the other two (6.0% in the protocol-based standard therapy group vs. 3.1% in the EGDT group vs. 2.8% in the usual-care group,  $P = 0.04$ ). There were no significant differences between the groups in the length of stay in the ICU, incidence and duration of cardiovascular or respiratory failure, length of hospital stay or discharge disposition. Even when the investigators restricted the analysis to the sickest third of the patients (those with the highest APACHE II scores and serum lactate), no benefit was seen in the two protocol-based groups.

Finally, serious adverse events were rare during the study and did not differ between the treatment groups.

#### ■ COMMENTARY

No improvement in outcomes, including mortality and length of stay in the ICU and hospital, was seen in patients who received protocol-based care. However, there are some aspects of the study that limit its findings to other settings. The patients were enrolled as soon as they were recognized to be in septic shock, so the observed benefits might not be as significant when septic shock is recognized later. Also, the care patients received before randomization may have had an impact on their subsequent clinical course. Finally, decisions to withdraw care in patients on life support are variable and their impact on in-hospital mortality during the study is unclear.

There are several interesting findings from the trial that can impact clinical practice. The rate of antibiotic administration in the first 6 hours after randomization was 97%, an exceptionally high and impressive figure. Data from multiple studies strongly supports the dictum that early recognition and antibiotic treatment are the keys to surviving sepsis. Patients in the two protocol-based treatment groups overall received more intravenous fluids, vasoactive agents and blood transfusions yet these interventions did not lead to improved outcomes. When analyzing these results is important to remember that all 3 of the study groups were treated according to the Surviving Sepsis Campaign guidelines<sup>2</sup> including early recognition of sepsis and septic shock, early antimicrobial treatment and conservative transfusion thresholds as well as moderate glycemic control, low tidal-volume ventilation and serial monitoring of serum lactate levels. Indeed, this latter intervention has been shown to be equivalent to the use of invasive central catheters for monitoring physiological parameters. Thus, this study provides clinicians with strong evidence that central hemodynamic monitoring should not be a priority in the management of septic shock. Instead, the focus should be on early recognition via serum lactate, prompt antibiotic administration and volume resuscitation with care taken to ascertain the adequacy of circulation. The ProCESS trial is likely to become an important milestone for the evidence-based management of septic shock.

#### References

1. Rivers E, et al. Early goal-directed therapy in the treatment of severe sepsis and septic shock. *N Engl J Med* 2001; 345:1368-77.
2. Dellinger RP, et al. Surviving Sepsis Campaign: international guidelines for management of severe sepsis and septic shock: 2008. *Crit Care Med* 2008; 36:296-327. ■

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## ABSTRACT & COMMENTARY

# Measles — It's Back Again, as Vaccine Refuseniks Travel to Endemic areas

By Stan Deresinski, MD, FACP, FIDSA

*Clinical Professor of Medicine, Stanford University, Editor of Infectious Disease Alert*

SYNOPSIS: The combination of global travel and resistance to vaccination has led to a resurgence of measles cases in the U.S.

SOURCE: Gastañaduy PA, et al. Measles — United States, January 1–May 23, 2014. *MMWR* 2014;63:1–4.

Measles was declared to have been eliminated in the U.S. in 2000. However, the infection is endemic in 5 of the 6 World Health Organization regions of the world and causes an estimated 20 million cases in the world each year. At the same time in the U.S. (and elsewhere), increasing numbers of parents are refusing to vaccinate their children. Thus, it perhaps should not be surprising that the CDC now reports that the 288 reported confirmed cases of measles in the first 143 days of 2014 is greater than the reported total yearly total cases for each year since 2000.

Fifteen outbreaks accounted for approximately four-fifths of cases, including one involving 138 cases, which had not ended at the time of this report. Cases were reported from 18 states and New York City and included 138 cases in Ohio (introduced by Amish missionaries returning from the Philippines), 60 in California, and 26 in New York City. Infections were associated with importation from a total of 18 countries in 97% of cases; the source could not be determined for the remaining 3%. These included 45 direct importations by 40 U.S. residents and 5 foreign visitors. The 40 U.S. travelers were unvaccinated, and 22 acquired measles in the Philippines, where 32,030 measles cases (26,014 suspected cases and 6,016 confirmed cases) and 41 measles deaths have been reported from January 1 through April 20.

Only 30 (10%) of cases occurred in individuals who were known to have been vaccinated, while unvaccinated individuals accounted for 200 (69%) of cases and 58 (20%) had an unknown vaccination status. More than half the cases occurred in 3 outbreaks that resulted from introduction of a case

into groups that remained unvaccinated because of philosophical or religious beliefs. Overall, such beliefs or unspecified personal objections accounted for 85% of those who were unvaccinated, while missed vaccination opportunities and being too young for vaccination accounted for 6% and 5%, respectively.

The age of those affected ranged from 2 weeks to 65 years, with 6% being <12 months. Those ages 1-4 years accounted for 17% of cases, while 25% were in individuals 5-19 years and 52% were >20 years. Fifteen percent were hospitalized. While there were no deaths and no cases of encephalitis, 5 patients developed pneumonia and one each had hepatitis, pancytopenia, and thrombocytopenia. In the U.S., MMR vaccination is recommended for all children, with the first dose given at 12-15 months and a second dose at 4-6 years, with catch-up vaccination for older children and adolescents who did not adhere to this schedule. In the absence of other evidence of immunity, adults should receive at least one dose of MMR while 2 appropriately spaced doses are recommended for healthcare personnel, college students, and international travelers. One dose of MMR vaccine is recommended for infants 6-11 months of age prior to travel, while 2 doses given at least 28 days apart are recommended for those >12 months.

The increase in measles cases in the U.S. is the result of a confluence of globalization and vaccine denial. The former cannot be avoided, but improved vaccination strategies as applied to international travelers is clearly indicated. Solving the problem presented by individuals and groups opposed to vaccination is much more difficult. ■

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## ABSTRACT & COMMENTARY

# PrEP for HIV

By Stan Deresinski, MD, FACP, FIDSA

*Clinical Professor of Medicine, Stanford University, Editor of Infectious Disease Alert*

SOURCE: US Public Health Service. Preexposure Prophylaxis for the Prevention of HIV Infection in the United States — 2014. A Clinical Practice Guideline. <http://www.cdc.gov/hiv/pdf/PrEPguidelines2014.pdf>

SYNOPSIS: The USPHS has provided an extensive document describing their recommendations for chemoprophylaxis of HIV infection in individuals with high levels of ongoing risk.

Daily preexposure prophylaxis (PrEP) with a fixed dose combination of tenofovir 300 mg and emtricitabine (200 mg) provides a level of protection against HIV infection among individuals

with substantial risk that is in excess of 90%. As a consequence, it is recommended as one prevention option for the following adults at substantial risk of infection (as defined below):

- Sexually active men who have sex with men (MSM)
- Heterosexually active men and women
- Adult injection drug users (IDU)

In addition, PrEP should be discussed with HIV-negative heterosexually active men and women whose partners are HIV-infected (discordant couples) with attention to issues of contraception and pregnancy. HIV infection, either acute or chronic, must be excluded immediately before initiation of PrEP by symptom review. Individuals receiving PrEP should be evaluated every 3 months for the presence of HIV infection and renal function should be evaluated every 6 months. They should have access to additional HIV prevention services and encouraged to maintain complete adherence to their regimen.

#### Indications for PrEP in adult MSM

- Not HIV infected
- Any male sex partner in previous 6 months (if also sex with women see next section)
- Not in a monogamous partnership with a recently tested HIV-negative man

AND >1 of the following:

- Any receptive or insertive anal sex without condoms in past 6 months
- Any sexually transmitted disease in the past 6 months
- In an ongoing sexual relationship with an HIV-infected male partner

#### Indications for PrEP for heterosexually active adult men and women

- Not HIV infected
  - Any sex with opposite sex partners in previous 6 months
  - Not in a monogamous partnership with a recently tested HIV-negative partner
- AND >1 of the following:
- Is a man who has sex with both women and men (with latter, see above)
  - Infrequently uses condoms during sex with >1 partners of unknown HIV status known to be at substantial risk of HIV infection (IDU or bisexual male partner)

- Is in an ongoing sexual relationship with an HIV-infected partner

#### Indications for PrEP use by adult IDU

- Not HIV infected
  - Any injection of drugs not prescribed by a clinician in past 6 months
- AND >1 of the following:
- Any sharing of injection or drug preparation equipment in past 6 months
  - Been in a methadone, buprenorphine, or suboxone treatment program in past 6 months
  - Risk of sexual acquisition as described in above.

In addition to evaluating individuals for the presence of acute or chronic before initiating PrEP, they should undergo serological testing for hepatitis B virus (HBV) and hepatitis C virus infection. Those susceptible to HBV infection should be vaccinated. Separately, the USPHS has provided checklists and patient information to assist in the initiation and management of PrEP.<sup>1</sup>

Overall, the new guidelines stress the importance of determining individual risk for HIV, PrEP use, adherence to medication, and regular monitoring of health and risk behaviors. One section that has stirred some controversy is the PrEP recommendation for individuals in an ongoing sexual relationship with an HIV-infected partner. This recommendation has raised questions regarding its applicability when the infected partner is fully virologically suppressed, a circumstance in which the risk of transmission has been found to be minimal.<sup>2</sup>

#### References

1. US Public Health Service. Preexposure Prophylaxis for the Prevention of HIV Infection in the United States – 2014. Clinical Provider's Supplement. <http://www.cdc.gov/hiv/pdf/guidelines/PrEPProviderSupplement2014.pdf>
2. Loutfy MR, et al. Systematic review of HIV transmission between heterosexual serodiscordant couples where the HIV-positive partner is fully suppressed on antiretroviral therapy. *PLoS One* 2013;8(2):e55747. ■

# Cefepime is not Inferior to carbapenems in the treatment of Enterobacter BSIs

By Stan Deresinski, MD, FACP, FIDSA

Clinical Professor of Medicine, Stanford University, Hospital Epidemiologist, Editor of Infectious Disease Alert

SYNOPSIS: A retrospective analysis indicates that cefepime is effective in the treatment of patients with bacteremia due to Enterobacter species.

**T**reatment of patients with Enterobacter bacteremia with 3rd generation cephalosporins has been associated with the emergence of resistance during therapy. Enterobacter is among the Enterobacteriaceae that carry a chromosomal ampC gene. The product of this gene is a cephalosporinase capable of hydrolyzing most 3rd generation cephalosporins. While this gene is inducible, stably derepressed mutants occur at a frequency of approximately 10<sup>-7</sup> and may be selected by exposure to a 3rd generation cephalosporin. As a consequence, some have suggested that a carbapenem is preferred for treatment of Enterobacter bacteremia. Cefepime (which has been called a 4th generation cephalosporin), is more stable to ampC, than are 3rd generation cephalosporins, raising the possibility that it may be an effective and safe agent for the treatment of serious infections due to Enterobacter.

Seidner and colleagues retrospectively examined the efficacy of treatment of bacteremia due to Enterobacter species with either cefepime or a carbapenem in 368 patients at 2 Boston hospitals. Of the 271 who had repeat blood cultures within one day of the initial positive, only 29 (11%) had a positive result (“persistent bacteremia”). Among patients who received monotherapy, this was observed in 4 of 16 (25%) who received a carbapenem

(imipenem or meropenem) and in 0 of 36 (P<0.01) given cefepime. Most patients, however, received more than one antibiotic and when the entire group was considered, no individual antibiotic was independently associated with persistence of bacteremia or with mortality.

#### ■ COMMENTARY

The results here are consistent with a smaller retrospective study that also demonstrated the efficacy of cefepime in the treatment of a variety of infections (bloodstream, pulmonary, intra-abdominal) due to ampC-producing Enterobacter, Citrobacter and Serratia.<sup>1</sup>

While there are a number of potentially confounding factors in the study by Siedner et al, especially that most patients received more than one antibiotic, the evidence supports the notion that cefepime is not inferior to carbapenems in the treatment of Enterobacter infection.

#### Reference

1. Tamma PD, et al. The use of cefepime for treating ampC beta-lactamase-producing Enterobacteriaceae. *Clin Infect Dis* 2013;57:781-8. ■

## ABSTRACT & COMMENTARY

# Study: Despite Glove use, HCWs caring for *C. diff* patients end up with spores on hands

By Eric C. Walter, MD, MSc

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Dr. Walter reports no financial relationships relevant to this field of study.

SYNOPSIS: After caring for patients with *Clostridium difficile* infection, nearly 25% of health care workers were found to have hand contamination with *C. difficile* spores.

SOURCE: Landelle C, et al. Contamination of healthcare workers' hands with *Clostridium difficile* spores after caring for patients with *C. difficile* infection. *Infect Control Hosp Epidemiol* 2014;35:10-15.

**C***lostridium difficile* is a prominent pathogen in intensive care units (ICUs) and frequently leads to nosocomial infections. One of the most common modes of transmission of *C. difficile* is via the hands of health care workers (HCWs). In this study, Landelle and colleagues aimed to determine how often HCWs' hands became contaminated with *C. difficile* after caring for

patients with *C. difficile* infection (CDI). They also identified risk factors for hand contamination.

In this prospective study, HCWs caring for patients with and without CDI were observed daily over an 8-week period. Patients were located in the ICU and medical and surgical hospital wards. Over the course

of the study, HCWs caring for seven patients with CDI and 16 control patients without CDI were observed. Observations included patient contact time, level of risk of patient contact (high risk was defined by the possibility of HCWs' hands to be highly contaminated with fecal material), use of gloves, hand hygiene compliance, etc. All patients with CDI were placed in contact precautions. For HCWs, these precautions included the use of dedicated equipment, donning a disposable gown with full-length sleeves and gloves prior to entering the room, hand hygiene with an alcohol-based solution before wearing gloves, and hand hygiene with soap and water followed by alcohol-based solution after glove removal. HCWs' hands were sampled for *C. difficile* spores immediately after caring for patients, following glove removal, but before hand washing.

Amazingly — and also disturbingly — *C. difficile* spores were found on the hands of nearly one out of every four HCWs who had cared for patients with CDI (16/66, 24%). *C. difficile* spores were not isolated from any HCWs caring for patients without CDI (0/44). Having more patient contacts or more contacts with a patient's environment was associated with a higher risk of hand contamination. The number and length of high-risk contacts as well as lack of glove use were also risk factors for hand contamination. After controlling for multiple risk factors using logistic regression, high-risk contact (odds ratio per 1 contact increment, 2.78; 95% CI, 1.42-5.45;  $P = 0.003$ ) and at least 1 contact without the use of gloves (odds ratio 6.26; 95% CI 1.27-30.78;  $P = 0.02$ ) was associated with hand contamination.

#### ■ COMMENTARY

In this study, Landelle and colleagues report a

distressingly high proportion of HCWs found to have hand contamination with *C. difficile*. Remember this study the next time you go to shake the hand of a colleague caring for a patient with CDI. Even more worrisome, 24% may be a low estimate of the proportion of HCWs with hand contamination. In this study, all HCWs knew they were being observed. Despite knowing this, 7.8% of contacts occurred without the use of gloves. In unobserved settings, the lack of glove use is likely to be higher. Despite only 7.8% of contacts occurring without gloves, 24% of HCWs had contaminated hands. Some contamination can be explained by the lack of glove use but 56% of the HCWs with contaminated hands used gloves for all patient contacts. Gloves are not perfect.

There are some limitations to this study. The number of HCWs observed caring for patients with CDI was adequate but not large ( $n = 66$ ) and there were only seven patients with CDI during the study. HCWs' hands were not sampled for *C. difficile* spores prior to entering patient rooms, so it is possible that contamination was present prior to caring for patients with CDI. However, no spores were identified on the hands of HCWs caring for patients without CDI. It is presumed that hand contamination with spores is a risk for transmission of *C. difficile* but the degree of risk is not known, and this study does not address this question.

In summary, this study offers strong evidence that HCWs' hands become contaminated with *C. difficile* spores during patient care and that glove use and contact precautions decrease the risk of contamination but are not perfect. The implied importance of washing your hands vigorously with soap and water after glove removal should not need repeating. ■

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## Value of Electronic Surveillance for Hospital CAUTIs

By Joseph F. John, Jr., MD, FACP, FIDSA, FSHEA

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Dr. John reports no financial relationships relevant to this field of study.

SYNOPSIS: Compared to manual surveillance methods, an electronic surveillance tool for catheter-associated urinary tract infections had a high negative predictive value but a low positive predictive value.

SOURCE: Wald HL, et al. Accuracy of electronic surveillance of catheter-associated urinary tract infection at an Academic Medical Center. *Infect Control Hosp Epidemiol* 2014;35:685-91.

A group from the University Of Colorado School Of Medicine constructed this study to determine if electronic surveillance for catheter-associated urinary tract infections (CAUTIs) was as good or better than standard surveillance. They used an electronic algorithm to detect UTI in 1695 patients in 2009 and 2010. The patients were included if they had a “high clinical suspicion” of having a CAUTI. The hospital was a 425-bed urban setting. Patients were adults 18 years of age or older. Manual surveillance was the comparator arm. The average age was 57 years and there was a male to female split of 49% to 42% with the remainder unknown. Of the 1695 patients studied, 64 were detected to have CAUTI electronically (15 were true positives) and only 19 were identified by manual surveillance. Electronic surveillance had a high negative predictive value (NPV) but a low positive predictive value (PPV = 23%). There was a 97% agreement between the electronic algorithm and the manual method. On the basis of these predictive values, the authors felt that electronic surveillance would be a good screening tool. The authors suggest that the test characteristics of the electronic algorithm could be improved in order to improve data pulls.

#### ■ COMMENTARY

The best thing to say about this study is that, while creative, its electronic surveillance could be used in its present form primarily for screening to eliminate

negative cases, i.e. its high NPV. This conclusion is somewhat disappointing but electronic surveillance is in its infancy so that the test characteristics when improved may raise the PPV and the tool could be a stand along.

In the meantime, manual surveillance has a wisdom that electronic surveillance cannot approach in documenting true infections. That does not mean that we should not try to continue to use innovative software to help us in this era of mega-data. This article used a Structured Query Language code in Microsoft Access to apply an algorithm that ends in either a CAUTI or an asymptomatic catheter-associated infection. To result in a CAUTI the patient needs to have symptoms and that is the challenging rub for the software to figure out. If there are no symptoms but a positive blood culture the diagnosis is considered at least a level of CAUTI. If there are no symptoms and the blood culture is negative, the urine culture positive for less than 2 organisms at a count of 100,000/cc, then there is then there is not a CAUTI, but a CAASB, a catheter-associated asymptomatic bacteriuria. While all this process through the algorithm sounds complex—and it is—the use to Infection Control will be a final software that should be easy to apply.

Keep eyes peeled for use of algorithms in software that detects common hospital-acquired infections. For the time being, let us hope this electronic detection of CAUTI can be refined and demonstrate more sensitivity. ■

Infectious  
Disease [ALERT]

## Updates

By Carol A. Kemper, MD, FACP

### CDC update on polio vaccination for travelers

CDC Health Alert Network, June 2, 2014; Health Advisory Regarding Polio Vaccination. <http://www.polioeradication.org/Portals/0/Document/Emergency/PolioPHEICguidance.pdf>

For only the second time since 2005, the Director General of the WHO, under the authority of the International Health Regulations Act, has issued a directive for those traveling to or from countries endemic for polio, in order to stem the recent and somewhat alarming spread of

disease. In reality, this directive is more of a “suggestion”, as it is not clear at all how the governments of the countries involved will respond or are capable of enforcing the recommendations.

Presently, 10 countries are experiencing active transmission of wild-type polio virus (WPV), including Cameroon, Somalia, Nigeria, Ethiopia, Equatorial Guinea, Iraq, Israel, Afghanistan, Pakistan and Syria (Syrian Arab Republic). Travelers from 3 of these countries have recently been responsible for exporting WPV

to another country — including travelers from Cameroon, Pakistan and Syria.

The recommendations are as follows:

- Travelers to polio-affected areas should receive oral polio vaccination or booster polio vaccination (IPV) prior to travel (only IPV is available in the United States);
- Residents or long-term visitor of > 4 weeks duration traveling from Pakistan, Cameroon, and Syria (responsible for exporting WPV) should receive oral polio vaccine or

inactivated poliovirus vaccine (IPV) between 4-52 weeks prior to any travel;

- Those who must travel from these 3 countries with less than 4 weeks notice, and who have not received OPV or IPV within the past year, must receive a dose at least by departure;
- Residents and long-term travelers of > 4 weeks duration traveling from the remaining 7 countries should be “encouraged” to receive OPV or IPV within 4-52 weeks of travel, or at least by the time of departure.
- These recommendations will remain in place for the above countries for at least 6 months following improved control of WPV transmission and no further exportation of disease.

The booster should be documented on the yellow International Vaccine Certificate of Vaccination. ■

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## Washington state: Not just for apples?

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CDC. Notes from the field: *Coccidioides immitis* identified in soil outside of its known range – Washington, 2013. *MMWR* 2014;63(20):450.

**C**occidioidomycosis (“Valley fever”) is acquired from a narrow strip of hot, dusty earth, commonly called the “Sonoran Life Zone”, roughly stretching south of Fresno down the San Joaquin Valley of California, to the more arid portions of the Southwestern United States, parts of Texas, and northern Mexico (*C. immitis*), as well as occasional cases occurring in South America (*C. posadasii*). My old friend, Dr. Richard Tucker, who held down the infectious disease turf in Wenatchee Washington for many years, saw more cases of cocci in “non-cocci country” than I ever did in San Jose – migrants would come up the California central valley, picking strawberries and lettuce, and by the time they arrived in central Washington to

pick apples in the fall, they had developed symptomatic infection. Similarly, many of his older patients would winter in Arizona or New Mexico and return to Wenatchee in the spring with active cocci. He referred to these as his “snow bunny” cases.

Three cases of acute coccidioidomycosis occurring in south central Washington State in 2010-2011 did not, however, fit these descriptions – and none of the 3 patients had been to areas of risk for at least 22 months, well outside the usual window for exposure. Given the atypical presentation, the cases prompted further investigation – and soil samples in areas where the patients had fallen or played, adjacent to animal burrows or snake holes, near a residential complex were collected. In addition, soil samples from a road frequented by all-terrain vehicles were collected — and banked — as there was no good way at the time to test the samples for cocci.

Three years later, newer PCR technologies for detecting *C. immitis* DNA, developed by the Translational Genomics Research Institute, became available. Six of 22 soil samples yielded *Coccidioides* DNA. Viable *C. immitis* was isolated from 4 of these 6 samples using a modified yeast extract medium. Whole genomic sequencing demonstrated homology between one of the patient isolates and the soil isolates. The Washington State soil isolates were both viable and had obviously resulted in active disease in humans. ■

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## STDs surge, young men lack a ‘healthy fear’

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ProMED-mail post. June 2, 2014; [www.promed-mail.org](http://www.promed-mail.org)

**J**ust as cell phones have transformed commerce in

rural Africa, cell phones apps have transformed sex in the United States. Alaska reports a 60% increase in cases of syphilis from 2012 to 2013 — all in men, and Oregon recently reported an 18% jump in cases of gonorrhea. San Francisco County has recorded spikes in all STDs for the past six years — and the number of early syphilis cases rose from 659 in 2010 to 682 in 2011 (the last year for which unofficial numbers are available). It is estimated that each new cases of syphilis results in, on average, exposure to 10 additional people.

And, as mentioned in the May issue of *IDA*, we’ve observed similarly alarming trends in the frequency of STDs in MSM newly presenting or returning for care to our Santa Clara County-based HIV/AIDS Clinic. In calendar year 2013, 500 MSM were screened for GC/Chlamydia using nucleic acid amplification (NAAT) (using the APTIMA GenProbe Unisex swab testing kit) (informal data, Wilson Ly, PharmD.). The patients did self-swabbing of 2 sites (oral and rectum), under the supervision of the HIV Pharmacy Specialist, who assists with the initial intake visit, and urine samples were collected. Overall, 14% of cultures from all sites were positive for at least one organism. The highest prevalence of GC was 11% in the oropharynx; and the highest prevalence for Chlamydia was 23% from the rectum. Most of these infections were asymptomatic.

This resurgence of STDs may be largely attributed to the availability of internet hook-ups and networking mobile smartphone apps, such as Grindr, Tinder, and GROWLr, as well as the increased use of methamphetamines, and

what is euphemistically termed “prevention fatigue”. As one man phrased it, younger people who did not live through the AIDS crisis in the 1980s and 1990s lack “healthy fear.”

Grindr is a gay social networking application launched in 2009 and available worldwide — it runs on the iPhone, blackberry and Android. Using GPS technology, the app allows users to meet other men within close proximity who are interested and available for whatever specified sexual activity using the phones mobile location services — we tried it in our Santa Clara county HIV clinic the other day and someone was available and interested in having sex not more than 75 feet away — they were in the same building!

What can be done to stem this rising tide of STDs? ■

## Pubic lice – finding fewer ‘landing strips’

Dholakia S, et al. Pubic lice: An endangered species? *Sexual Trans Dis* 2014;41:388-391.

**T**hese British investigators noted a continued decrease in cases of pubic lice in their

unit, which they hypothesized may be due, in part, to the increased popularity of pubic hair removal. While I admit to having seen many a case of “crabs” while moonlighting in the ER in the 1990s, I am unable to recall seeing a case of pubic lice in more than decade. Granted, I am no longer on the front lines, but I do provide primary care to 150 HIV+ men and women, and cases of syphilis are a dime a dozen these days.

The incidence of pubic lice is estimated to be 1.3% to 4.6%, with an average world-wide incidence of about 2%. But over the past 10 years, the incidence of pubic lice in Buckinghamshire fell from 1.8% to .07%, with only 17 cases recognized in 2013.

Concurrently, the frequency of pubic hair removal seemed to be increasing.

The authors conducted an anonymous survey of 500 randomly selected clinic visitors every year for 10 years. A total of 3850 surveys were returned. The average age of respondents was 24 years. During the 10-year period, a clear shift in practices towards pubic hair removal

was observed: partial or total removal of pubic hair increased from 33% to 87.5%. Only 12.5% of respondents “went native”. Total removal of all pubic hair increased from 24% to 56% — meaning the majority of younger folks attending the clinic had gone “Yul Brynner.” Shaving was the most common means of hair removal (70%), followed by waxing and laser. The only reasons provided for this practice were appearance and hygiene.

There was a strong inverse linear correlation between the declining incidence of pubic lice and hair removal. Hair removal was somewhat more frequent in women than men (data not provided), although the practice was also gaining in popularity amongst men. The authors suggest the observed shift in frequency of pubic lice in men compared with women may be because the practice is not quite as common yet in men.

Maybe these youngsters are onto something? Just think, if there was a world-wide annual pubic hair shaving week, pubic lice might truly become extinct. Too bad it doesn’t work for other STDs. ■

## HIC wins 1st as best healthcare newsletter

**W**e are proud to announce that our sister publication, *Hospital Infection Control & Prevention*, recently won First Place for Best Healthcare Newsletter at the annual awards of the Specialized Information Publishers Association (SIPA) in Washington, DC.

Written by long-time HIC editor Gary Evans, the 2013 coverage included “Have virus will travel,” which anticipated the arrival of the first MERS cases in the U.S.

The trusted source for the infection preventionist for over four decades, HIC has won numerous editorial honors that include five prestigious awards from the National Press Club for analytical reporting. For breaking news, and posts both thought provoking and relatively mindless, check out Evans’ HICprevent blog at <http://hicprevent.blogs.ahcmedia.com/> Don’t forget to follow @HICPrevention on Twitter for the continuing adventures of our stringer in the wasteland, complete with prototype PPE, the beoggled and beak-masked Plague Doctor. ■

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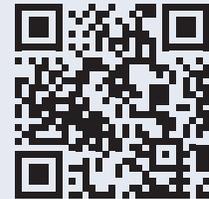
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## CME INSTRUCTIONS

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5. Once the completed evaluation is received, a credit letter will be e-mailed to you instantly.



## CME QUESTIONS

### 1. Depending on their tinerary and previous history, travelers to Brazil might need pre-travel:

- A. malaria vaccination
- B. chikungunya prophylaxis
- C. dengue vaccination
- D. education about insect repellents
- E. all of the above

### 2. Which of the following are U.S. recommendations for MMR vaccine?

- A. It is recommended for all children with the first dose at 12-15 months of age.
- B. Children vaccinated in infancy should receive a second dose at 4-6 years of age.
- C. In the absence of documentation of childhood vaccination or other evidence of immunity, adults should receive at least one dose.
- D. All of the above.

### 3. Which of the following medications is the recommended pre-exposure prophylaxis for HIV infection?

- A. A fixed dose combination of abacavir and efavirenz.
- B. A fixed dose combination of tenofovir and emtricitabine
- C. High dose raltegravir.
- D. Raltegravir plus darunavir.

## CME OBJECTIVES

Upon completion of this educational activity, participants should be able to:

- discuss the diagnosis of infectious diseases;
- explain current data regarding the use of new antibiotics for commonly diagnosed diseases and new uses for traditional drugs;
- discuss the latent information regarding risks, benefits, and cost-effectiveness of new and traditional diagnostic tests; and
- discuss new information regarding how infectious diseases are transmitted and how such information can lead to the development of new therapies

## TIPPING POINT

*"It turns out that most of the nasty, infectious diseases of human history came to us from domestic animals. Thirteen of the fourteen herd domestic animals were Eurasian species. The only herd domestic animal of the New World was the llama, but the llama didn't live in really big herds. So we didn't get diseases from llamas, but we did get diseases from pigs and sheep. And Eurasian people in general got exposed to these diseases at childhood and therefore developed an immune system. In the New World, smallpox arrives and nobody is exposed to it, so it's hitting everybody, including adults."*

Jared Diamond, commenting on his book "Guns, Germs and Steel." <http://bit.ly/UbfjaG>

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A handwritten signature in black ink, appearing to read 'Lee Landenberger', with a long horizontal flourish extending to the right.

Lee Landenberger  
Continuing Education and Editorial Director