Botulism: Food Safety
David Young, Foodborne Disease Epidemiologist

Botulism is a rare but serious illness caused by a potent neurotoxin produced by anaerobic, spore-forming Clostridium botulinum bacteria or other Clostridia strains. There are 5 categories of botulism:

1. foodborne botulism;
2. infant botulism resulting from an infant ingesting and becoming colonized with C. botulinum spores;
3. wound botulism resulting from wound contamination following a traumatic injuring and occurs more frequently among persons who inject drugs;
4. adult intestinal toxemia a rare form of intestinal colonization in persons with a history of gastrointestinal surgery or illness like inflammatory bowel disease and
5. iatrogenic botulism resulting from an overdose of injected botulinum toxin for cosmetic or medical purposes.

This article will focus on foodborne botulism.

Foodborne botulism occurs when a person ingests the botulinum toxin from contaminated food. The neurotoxin attacks the body's nervous system which leads to illness within a few hours to days. Illness begins with involvement of the cranial nerves causing weakness or paralysis of the muscles that control the eyes, face, mouth and throat causing double or blurred vision, drooping eyelids, slurred speech and difficulty swallowing. This weakness or paralysis may descend to the neck, arms, torso and legs. Botulism also can weaken or paralyze the muscles involved in breathing which can lead to difficulty breathing and even death.

The conditions in which C. botulinum spores can grow and make toxins in food include low-oxygen or anaerobic environment or low acid, sugar or salt environment conditions. Common sources of foodborne botulism are foods that have been improperly canned, preserved, or fermented during home processing. Though uncommon, store-bought foods also can be contaminated with botulinum toxin.
To prevent foodborne botulism safe home canning recommendations should be stringently followed, particularly for vegetables with a low acid content, which are the most common source of home canning related botulism. Store-bought and home-canned food containers should be inspected for leakage, bulging or swelling, cracks or other damage. Even containers that appear intact should be suspected to be contaminated if the container spurts liquid or foam when opened or the food inside is discolored, moldy, or smells bad.

Food that is suspected to be contaminated should be discarded. Instructions on the CDC web site at https://www.cdc.gov/botulism/consumer.html will help prevent people and animals from accidentally coming into contact with food that may be contaminated.

Botulism is a reportable condition in South Carolina.

Suspected cases should be immediately reported to DHEC by phone. Botulinum toxin if administered early in the course of illness can prevent progression of illness and shorten its duration and can be requested from the CDC through DHEC if indicated.

This material was sourced from https://www.cdc.gov/botulism.

CRE and CRPA Reporting in SCION

Katie Waites, Healthcare Associated Infections Epidemiologist

Antimicrobial-resistant organisms continue to emerge as a growing public health concern. Isolates harboring a carbapenemase are considered a greater public health threat because they are potential reservoirs for transmission and amplification of a broad spectrum resistance mechanism. In 2013 the Centers for Disease Control and Prevention (CDC) published, “Antibiotic Resistant Threats in the United States” and named Carbapenem-resistant Enterobacteriaceae (CRE) an urgent threat to public health, noting that, “CRE have become resistant to nearly all the antibiotics we have today. Almost half of hospital patients who get bloodstream infections from CRE bacteria die from the infection.” (CDC, 2013). Carbapenem-resistant Pseudomonas aeruginosa (CRPA) is noted as a serious threat.

In 2018, South Carolina will add CRE and CRPA to the List of Reportable Conditions. These conditions were only lab-reportable in 2017. Requiring provider reporting will provide epidemiological data not captured by laboratory reports.

DHEC’s addition coincides with the Council of State and Territorial Epidemiologists (CSTE) Position Statement in June 2017, recommending that CRE become nationally-notifiable for E. coli, Klebsiella, and Enterobacter species.

After receiving and processing the clinical specimens from hospital or commercial laboratories, the DHEC Public Health Laboratory will continue shipping these samples to one of seven CDC Antibiotic Resistance Laboratory Network (ALRN) facilities for further testing and confirmation, as illustrated by the diagram below. The ALRN detects and tracks changes in resistance and helps public health departments identify and respond to outbreaks more quickly.

In August, 2016, DHEC received Federal funding from CDC to establish a statewide Antimicrobial Resistance Collaborative. With partners from the University of South Carolina School of Medicine and College of Pharmacy, the Antimicrobial Stewardship Collaborative of South Carolina (ASC-SC) embarked on an ambitious journey to coordinate with healthcare providers across the state for a common goal: to reduce the threat of antimicrobial resistance in South Carolina. Multi-drug resistant organisms such as CRE and CRPA are a primary focus of ASC-SC’s activities across the state.

U.S. Antibiotic Awareness Week took place November 13-19, 2017. The campaign coincided with an international campaign from the World Health Organization, World Antibiotic Awareness Week. Please visit the following websites to learn what you can do to fight antibiotic resistance:

- https://www.cdc.gov/antibiotic-use/week/index.html
Dengue Virus Infections
Dan Drociuk, Surveillance Epidemiologist

Dengue is a potentially fatal acute febrile illness caused by infection with any of four dengue viruses (DENV-1, -2, -3, and -4). Although ~75% of individuals infected with a DENV will be asymptomatic, ~5% of individuals that develop dengue will progress to severe dengue, an illness characterized by plasma leakage leading to hypovolemic shock, hemorrhage, and potentially death. The case-fatality rate for individuals with severe dengue can be as high as 10% if untreated, or 0.1% with appropriate clinical management.

DENVs are transmitted primarily through the bite of Aedes aegypti and Ae. albopictus mosquitoes. Because these mosquitoes are endemic throughout the tropics and subtropics, an estimated 40% of the world’s population is at risk for DENV infection. These mosquitoes are also present in the United States. Ae. aegypti is present throughout southern Florida, southern Louisiana, parts of New Mexico and Arizona, prominently in urban centers in southern and central Texas, and have recently been detected in central California and southern Utah. Ae. albopictus is widely present throughout most of the southern United States and as far north as Illinois and New York. Both Ae. aegypti and Ae. albopictus have been found in mosquito traps in South Carolina.

Symptoms of infection usually begin 4–7 days after a bite from an infected mosquito and typically last 3–10 days. In order for transmission to occur the mosquito must feed on a person during a 5-day period when large amounts of virus are in the blood; this period usually begins a little before the person becomes symptomatic. Asymptomatic people can still infect mosquitoes while they are viremic. The virus will require an additional 8–12 days incubation in the mosquito before it can then be transmitted to another human. The mosquito remains infected for the remainder of its life, which might be days or a few weeks. In rare cases dengue can be transmitted in organ transplants or blood transfusions from infected donors, and there is evidence of transmission from an infected pregnant mother to her fetus.

Dengue epidemics require a coincidence of large numbers of vector mosquitoes, large numbers of people with no immunity to one of the four virus types and the opportunity for contact between the two. Although Aedes are common in the southern U.S., endemic in northern Mexico, and the U.S. population has no immunity, sustained dengue transmission does not occur in the continental U.S. primarily because contact between people and the vectors is too infrequent.

Nearly all dengue cases reported in the 48 continental states were acquired elsewhere by travelers or immigrants1,2. Imported cases rarely result in secondary transmission. Most dengue cases in U.S. citizens occur in those inhabitants of Puerto Rico, the U.S. Virgin Islands, Samoa and Guam, which are endemic for the virus. Outbreaks of dengue are infrequent; however several outbreaks have occurred in Florida in recent years3, which emphasize the need for continued vigilance by clinicians for possible cases in South Carolina. All individuals with imported dengue are advised to avoid local mosquito exposure during the time they could be viremic to prevent local transmission.

There is no vaccine available against dengue, and there are no specific medications to treat a dengue infection. This makes prevention by avoiding mosquito exposure the most important step if you live in or travel to an endemic area. The best way to reduce mosquitoes is to eliminate the places where the mosquito lays eggs, like artificial containers that hold water in and around the home. Outdoors, clean water containers like pet and animal watering containers, flower planter dishes or cover water storage barrels. Look for standing water indoors such as in vases with fresh flowers and clean at least once a week. The adult mosquitoes like to bite inside as well as around homes, during the day and at night when the lights are on. To protect yourself, use repellent on your skin
while indoors or out. When possible, wear long sleeves and pants for additional protection. Also, make sure window and door screens are secure and without holes. If available, use air-conditioning.

For more information, go to: www.cdc.gov/dengue.

Reference:

Footnotes:
1 Travel Associated Dengue Infections – United States, 2001-2004
2 Imported Dengue – United States, 1999 and 2000

Update: Interim Guidance for Health Care Providers Caring for Pregnant Women with Possible Zika Virus Exposure
Leon Bullard, MD, MA, Acute Disease Epidemiology Medical Consultant

On July 24th, the Centers for Disease Control and Prevention (CDC), released a revised protocol for Zika virus testing. This updated guidance was initiated by the CDC in response to accumulating evidence of 1) declining prevalence of Zika virus disease in the Americas and 2) emerging epidemiologic and laboratory evidence indicating prolonged Zika virus DNA (IgM antibodies) survival beyond 12 weeks post infection.

As the prevalence of Zika virus disease declines, the likelihood of false-positive test results increases. IgM test results for Zika antibodies cannot always reliably distinguish between an infection that occurred during the current pregnancy or one that occurred before the current pregnancy, particularly for women with possible Zika virus exposure before the current pregnancy. A specific Zika IgG test is not currently available in the US.

CDC’s key recommendations for healthcare professionals providing care for pregnant women include the following:

1. All pregnant women in the United States and U.S. territories should be asked about possible Zika virus exposure before and during the current pregnancy, at every prenatal care visit.
2. Pregnant women with possible Zika virus exposure and symptoms of Zika virus disease should be tested to diagnose the cause of their symptoms.
3. Asymptomatic pregnant women with ongoing possible Zika virus exposure should be offered Zika virus NAT testing three times during pregnancy.
4. Asymptomatic pregnant women who have recent possible Zika virus exposure (i.e., through travel or sexual exposure) but without ongoing possible exposure are not routinely recommended to have Zika virus testing.
5. Pregnant women who have recent possible Zika virus exposure and who have a fetus with prenatal ultrasound findings consistent with congenital Zika virus syndrome should receive Zika virus testing to assist in establishing the etiology of the birth defects.
6. The comprehensive approach to testing placental and fetal tissues has been updated.
7. Zika virus IgM testing as part of preconception counseling to establish baseline IgM results for non-pregnant women with ongoing possible Zika virus exposure is not warranted.

The Zika virus disease testing protocol continues to evolve as new information is obtained. DHEC encourages healthcare providers for women of child-bearing age, and especially pregnant women, to be aware of the most current recommendations. The shared-decision making model, in which the patients and providers formulate a testing and treatment plan that incorporates the patients’ values and preferences with the clinicians’ clinical judgment, balanced risk assessment and potential outcomes, and the jurisdiction’s recommendations.

Legionnaires’ disease
Oluwole Babatunde, MBBS, MPH, Surveillance & Outbreaks Epidemiologist

In June 2017, the Centers for Disease Control and Prevention (CDC) published a Vital Signs report on Legionella associated with healthcare facilities. Legionnaires’ disease (LD) is a serious, and often deadly, cause of pneumonia. Individuals become infected by breathing in water droplets containing Legionella bacteria. People can also become infected if contaminated water accidentally enters the lungs while drinking. Hospitalized individuals and those in long-term care facilities may be at increased risk of complications from LD due to underlying medical conditions. Legionella should be considered in the differential diagnosis of anyone with atypical pneumonia or unexplained febrile illness, especially among patients aged 65 years and above, patients who have a history of smoking, pre-existing Chronic Obstructive Pulmonary Disease (COPD), or diabetes and/or a compromised immune system. Diagnostic tests for Legionella include the urine antigen test or isolation of the organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile fluid.
LEGIONNAIRES’ DISEASE CASES IN SOUTH CAROLINA, 2012–2016*

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>26</td>
<td>22</td>
<td>44</td>
<td>63</td>
<td>62</td>
<td>217</td>
</tr>
</tbody>
</table>

Mean of 43 cases per year

*Case counts do not include visitors reported in their state of residence who may have acquired disease in South Carolina.

PERCENT OF LEGIONNAIRES’ DISEASE CASES ASSOCIATED WITH A HEALTH CARE FACILITY - 2016

<table>
<thead>
<tr>
<th>Definitely</th>
<th>Possibly</th>
<th>Not</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated</td>
<td>associated</td>
<td>associated</td>
<td>not associated</td>
</tr>
<tr>
<td>5%</td>
<td>14%</td>
<td>37%</td>
<td>44%</td>
</tr>
</tbody>
</table>

Legionella grows best in buildings with large water systems that are not managed effectively. Community-acquired LD is associated with showers, faucets, cooling towers (air-conditioning units for large buildings), hot tubs that are not drained after each use, decorative fountains, hot water tanks, and large plumbing systems. Effective water management programs reduce the risk of Legionella growing and spreading in building water systems and can help prevent LD. To prevent LD, health care facilities should be aware of and adopt the new CDC guidelines published in June 2016. These guidelines recommend that a water management program be implemented for health care facilities where patients stay overnight or that house or treat people who have chronic and acute medical problems or weakened immune systems.

A Legionella water management program routinely consists of:

1. Establishing a water management program team.
2. Describing the building water systems using words and diagrams.
3. Identifying areas where Legionella could grow and spread.
4. Deciding where control measures should be applied and how to monitor them.
5. Establishing ways to intervene when control limits are not met.
6. Making sure the program is running as designed and is effective.
7. Documenting and communicating all the activities.

Additional information available at:
https://www.cdc.gov/vitalsigns/legionella/.

A Legionella water management program consists of:

1. Establishing a water management program team.
2. Describing the building water systems using words and diagrams.
3. Identifying areas where Legionella could grow and spread.
4. Deciding where control measures should be applied and how to monitor them.
5. Establishing ways to intervene when control limits are not met.
6. Making sure the program is running as designed and is effective.
7. Documenting and communicating all the activities.


Legionnaires’ disease is on the rise

Pertussis Testing
Steven Battle, DO, MPH, Acute Disease Epidemiology Medical Consultant

Pertussis, more commonly known as whooping cough, was a common childhood disease and a major cause of child and infant mortality in the United States during its pre-vaccine era. Pertussis is a contagious respiratory disease caused by the bacterium Bordetella pertussis. The illness is characterized by a prolonged paroxysmal cough (multiple, rapid coughs), which is often accompanied by an inspiratory whoop. Disease presentation can vary with age and history of previous exposure or vaccination. Early diagnosis and treatment of pertussis might limit its spread to other susceptible people. Pertussis testing should be considered in individuals with prolonged paroxysmal coughing.

Persons with pertussis are infectious from the beginning of the catarrhal stage (runny nose, sneezing, low-grade fever, symptoms of the common cold) through the third week after the onset of paroxysms or until five days after the start of effective antimicrobial treatment. Treatment should not be delayed pending the results of testing. Asymptomatic contacts of confirmed cases should not be tested and testing of contacts should not be used for post-exposure prophylaxis decisions.

Isolation of B. pertussis by bacterial culture remains the gold standard for diagnosing pertussis according to the Centers for Disease Control and Prevention (CDC). However, the fastidious growth requirements make B. pertussis difficult to isolate. Serologic testing is not recommended to confirm the diagnosis of pertussis because antibody response can be non-specific or could reflect previous disease. Commercially, there are many different serologic tests used in the United States with unproven or unknown clinical accuracy. Serologic testing could be useful for adults and adolescents who present late in the course of their illness, when both culture and Polymerase Chain Reaction (PCR) are likely to be negative.

PCR testing is an important tool for timely diagnosis of pertussis and is increasingly available to clinicians. PCR detects DNA sequences of the B. pertussis bacterium, and unlike culture, does not require viable (live) bacteria present in the specimen. However, the high sensitivity of PCR means false positive results may be obtained. CDC recommends the following best practices to reduce the risk of obtaining inaccurate results:

1. Only test patients with signs and symptoms consistent with pertussis.
2. Perform PCR testing for pertussis during the optimal time frame. PCR testing is most reliable within the first three weeks after onset of cough and before the initiation of antibiotic therapy.
3. Optimize specimen collection
   - Obtain specimens for PCR testing by aspiration or swabbing the posterior nasopharynx.
   - Use thin, flexible, nasopharyngeal swabs with polyester, rayon, or nylon tips and aluminum or plastic shafts.
   - Throat swabs and anterior nasal swabs are not acceptable specimens.
   - Nasopharyngeal and aspirate specimen collection procedures can be found at https://www.cdc.gov/pertussis/clinical/diagnostic-testing/specimen-collection.html.
4. Avoid contamination of the clinical specimen by general adherence to basic infection control measures to prevent contamination of specimens.
5. Appropriately interpret testing results.

Clinical case definition: In absence of a more likely diagnosis a cough illness lasting > 2 weeks with one of the following symptoms:

- Paroxysms of coughing, OR
- Inspiratory “whoop”, OR
- Posttussive vomiting, OR
- Apnea (with or without cyanosis) (For infants aged <1 year only)

PCR is an important tool for diagnosis of pertussis especially in the setting of the current resurgence of pertussis disease. PCR can provide timely results with improved sensitivity over culture. Careful specimen collection and transport and a general understanding of the PCR assays performed will better ensure that clinicians obtain diagnostic test results that reliably inform patient diagnosis. Cases meeting the clinical case definition that are serologically positive, but not culture or PCR positive should be reported as probable cases to your local health department. South Carolina health care providers are required to report pertussis cases to the county health department where the patient resides within 24 hours by phone. For more information about reporting conditions in SC, go to: http://www.scdhec.gov/Library/CR-009025.pdf.
Health care providers are encouraged to contact your county health department with questions about testing for pertussis.

For more information, go to https://www.cdc.gov/pertussis/clinical/index.html.

References:


Updates to the List of Reportable Conditions for 2018
South Carolina Law 44-29-10 and Regulation 61-20 require reporting of conditions on the Official List of Reportable Conditions in the manner prescribed by DHEC. Changes in reporting criteria for 2018 are listed below.

• Footnote 12: Specimen submission of the first isolate of the month to the Public Health Laboratory is required for Carbapenem-resistant Pseudomonas aeruginosa.

Updates to Reportable Conditions
• Carbapenem-resistant Enterobacteriaceae (CRE) is now notifiable.
• Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) is now notifiable.
  • “Staphylococcus aureus, vancomycin-resistant or intermediate” with a VA > 6 MIC (VRSA/VISA).
  • “Bureau of Laboratories (BOL)” name has changed to Public Health Laboratory (PHL).
• Footnote 6: Rabies PCP guidance name changed to Rabies exposure prophylaxis
• Footnote 8: A pure, low passage isolate submitted on a non inhibitory, non-selective agar plate or slant is preferred.
• Footnote 10: A suspect case of TB is a person whom a health care provider suspects TB based on signs, symptoms, and/or laboratory evidence of TB.

Reporting reminders
1. What to report:
For all suspected and confirmed cases, report the following:
  • Patient’s name
  • Patient’s complete address, phone, county, date of birth, race, sex, last five digits of social security number
  • Physician’s name and phone number
  • Name, institution, and phone number of person reporting
  • Disease or condition
  • Date of diagnosis
  • Symptoms
  • Date of onset of symptoms
  • Lab results, specimen site, collection date
  • If female, pregnancy status
  • Patient status: In childcare, food-handler, healthcare worker, childcare worker, nursing home, prisoner/detainee, travel in last 4 weeks

2. How to report
This section’s layout was updated to clarify where specific conditions should be reported.

HIV, AIDS and STDs (excluding Hepatitis):
*Do not fax HIV, AIDS or STD results to DHEC* Call 1-800-277-0873; Submit electronically via DHEC’s web-based reporting system; or Mail to: Division of Surveillance & Technical Support Mills/Jarrett Complex Box 101106, Columbia, SC 29211

LEAD:
Mail to: Bureau of Health Improvement & Equity, Lead Surveillance c/o Brian Humphries Sims-Aycock Building, 2600 Bull Street, Columbia, SC 29201 Fax: 803-898-3236 Call 803-898-3641 to establish electronic reporting

This section’s layout was updated to reflect the changes in the telephone numbers for the Lowcountry. TB must be reported to the public health office in the region in which the patient resides.
DISEASE PREVENTION AND EPIDEMIOLOGY NEWSLETTER

<table>
<thead>
<tr>
<th>Where to Report Tuberculosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowcountry</td>
</tr>
<tr>
<td>Berkeley, Charleston, Dorchester</td>
</tr>
<tr>
<td>Nights/Weekends/Holidays: (803) 898-0558 Fax: (803) 898-0685</td>
</tr>
</tbody>
</table>

This section’s layout was updated to reflect the changes in the telephone numbers for the Lowcountry. All conditions other than HIV, AIDS, STDs, Lead and TB must be reported to the public health office in the region in which the patient resides. Immediately and urgently reportable conditions must be reported by telephone. Conditions which are routinely reportable must be reported via mail, fax or submitted electronically via DHEC’s web-based reporting system.

<table>
<thead>
<tr>
<th>Immediate and Urgent Reporting (TELEPHONE)</th>
<th>3-Day Reporting (MAIL or FAX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowcountry</td>
<td>Midlands</td>
</tr>
<tr>
<td>Berkeley, Charleston, Dorchester Phone: (843) 953-0043</td>
<td>Kershaw, Lexington, Newberry, Richland Phone: (803) 576-2749</td>
</tr>
<tr>
<td>Beaufort, Colleton, Hampton, Jasper Phone: (843) 549-1516 ext. 218</td>
<td>Chester, Fairfield, Lancaster, York Phone: (803) 286-9948</td>
</tr>
<tr>
<td>Allendale, Bamberg, Calhoun, Orangeburg Phone: (803) 268-5833</td>
<td>Aiken, Barnwell, Edgefield, Saluda Phone: (803) 642-1618</td>
</tr>
<tr>
<td>Nights/Weekends Phone: (843) 441-1091</td>
<td>Nights/Weekends Phone: (888) 801-1046</td>
</tr>
<tr>
<td>Nights/Weekends Phone: (803) 898-0558 Fax: (803) 898-0685</td>
<td></td>
</tr>
</tbody>
</table>

Links for Disease Reporting Information

Reportable Diseases Page on DHEC website  
www.scdhec.gov/Health/FHPF/ReportDiseasesAdverseEvents/ReportableConditionsInSC

PDF List of Reportable Conditions  

SC DHEC Disease Reporting Form  

Questions?

For questions about Disease Reporting or to discuss electronic disease reporting via DHEC’s electronic disease surveillance reporting system, call the DHEC Bureau of Disease Control in Columbia: 803-898-0861 (M-F 8:30 AM to 5 PM). To learn about DHEC’s web-based reporting system, call 1-800-917-2093 (M-F 8:30 AM to 5 PM).