VIBRIOSIS – NON-CHOLERA

Background
Vibriosis is caused by the *Vibrio* species gram-negative bacteria that grow well in salty environments, such as seawater or brackish water. They are commonly found in warm marine and estuarine environments. Illnesses caused by *Vibrio cholerae* O1 and O139 strains that produce cholera toxin are defined as cholera; illnesses caused by other *Vibrio* strains are called vibriosis.

There are many species in the genera *Vibrio*. The most commonly reported *Vibrio* species in the United States are *V. parahaemolyticus*, *V. vulnificus*, and *V. alginolyticus*. People with vibriosis become infected by consuming raw or undercooked seafood or exposing a wound to seawater. About 80% of infections occur from May through October when water temperatures are warmer. Large outbreaks linked to the consumption of raw oysters have occurred in the United States in the past. Environmental factors, such as temperature and salinity, can influence growth of *Vibrio* bacteria.

Symptoms and Clinical Diagnosis
When ingested, *Vibrio* bacteria can cause watery diarrhea, often accompanied by abdominal cramping, nausea, vomiting, fever, and chills. Usually these symptoms occur within 24 hours of ingestion and last about 3 days. Asymptomatic infections may occur. The organism may cause an extra-intestinal infection, such as a skin or wound infection, when an open wound is exposed to brackish or salt water. Severe illness is rare and typically occurs in people with a weakened immune system.

CDC estimates 80,000 people become sick with vibriosis, and 100 people die from their infection, in the United States every year. *Vibrio vulnificus* is the most lethal species and can cause bloodstream infections in people with liver disease; about half of these infections are fatal. Amputation may be needed for severe wound infections.

A clinician may suspect vibriosis if a patient has watery diarrhea and has recently eaten raw or undercooked seafood, especially oysters, or when a wound infection occurs after exposure to seawater. Infection is diagnosed when *Vibrio* bacteria are found in the stool, wound, or blood of a patient who has symptoms of vibriosis.

Treatment
Treatment is not necessary in mild gastrointestinal cases, but patients should drink plenty of liquids to replace fluids lost through diarrhea. Although there is no evidence that antibiotics decrease the severity or duration of illness, they are sometimes used in severe or prolonged illnesses. For more information about antibiotic treatment, please refer to the article by Wong, KC et al.

Risk Factors
Anyone can get sick from vibriosis, but you may be more likely to get an infection or severe complications if you:

- Have liver disease, cancer, diabetes, HIV, or thalassemia
- Receive immune-suppressing therapy for the treatment of disease
- Take medicine to decrease stomach acid levels
- Have had recent stomach surgery

Prevention
Reduce your risk of vibriosis by following these tips:

- Do not eat raw or undercooked oysters or other shellfish. Cook them before eating. For more information and tips for cooking shellfish, refer to CDC's tips.
- Always wash your hands with soap and water after handing raw shellfish.
- Avoid contaminating cooked shellfish with raw shellfish and its juices.
- Stay out of brackish or salt water if you have a wound (including cuts and scrapes), or cover your wound with a waterproof bandage if there is a possibility it could come into contact with brackish or salt water, raw seafood, or raw seafood juices.
- Wash wounds and cuts thoroughly with soap and water if they have been exposed to seawater or raw seafood or its juices.
- If you develop a skin infection, tell your medical provider if your skin has come into contact with brackish or salt water, raw seafood, or raw seafood juices.
- If you are at high risk for vibriosis, wear clothes and shoes that can protect you from cuts and scrapes when in brackish or salt water. Also wear protective gloves when handling raw seafood.

Laboratory Testing
Supportive laboratory evidence: Detection of a species of the family of *Vibrionaceae* (other than toxigenic *Vibrio* cholera O1 or O139, which are reportable as cholera) from a clinical specimen using a culture-independent diagnostic test.
Confirmatory laboratory evidence: Isolation of a species of *Vibrionaceae* (other than toxigenic *Vibrio* cholera O1 or O139, which are reportable as cholera) from a clinical specimen.

Vibriosis (non-cholera) isolates are required to be submitted to the Michigan Department of Health and Human Services (MDHHS) Bureau of Laboratories (BOL). Isolates from blood culture and wounds are accepted by MDHHS BOL. For stool specimens, the isolate or stool should be in Cary Blair preservative. Stool specimens can be submitted along with the broth specimen for additional testing.

Case Definitions
Probable**:** A case that meets the supportive laboratory criteria for diagnosis, or a clinically compatible case that is epidemiologically linked to a case that meets the supportive or confirmatory laboratory criteria for diagnosis.
Confirmed**:** A case that meets the confirmed laboratory criteria for diagnosis. Species identification and, if applicable, serotype designation (i.e., *Vibrio cholerae* non-O1, non-O139 or *Grimontia hollisae*) should be reported.

NOTE: Only *Vibrio cholerae* O1 or O139 should be reported as 'Cholera' in MDSS.

National Reporting
In addition to reporting through the National Notifiable Diseases Surveillance System (NNDSS), CDC collects and reports out summaries from the information obtained from the standard form for Cholera and Other *Vibrio* Illness Surveillance (COVIS). Both the form and summaries from past COVIS reports can be found on the CDC COVIS website.

In Michigan, MDHHS and MDARD collect information from the MDSS Vibriosis – Non-Cholera Disease Specific Form to submit data to both the CDC and FDA. Completing the form as thoroughly as possible (including information from the environmental health investigation) not only helps further the LHD's investigation, it also provides information for the COVIS form that is submitted to the CDC and FDA.

Seafood Investigation

If there is a known history of raw shellfish consumption at a facility, the shellfish tags should be obtained, even for single cases of vibriosis. Establishments are required to keep the shellfish tags for 60 days which is typically within the relevant timeframe of a potential investigation. Local Health Departments should promptly contact MDARD to coordinate collection of seafood records, tags, invoices, etc., for all instances of raw seafood or shellfish consumption.

References

- CDC Vibrio Species Causing Vibriosis Website: http://www.cdc.gov/vibrio/
- CDC Cholera Website: http://www.cdc.gov/cholera/index.html
- Wong, KC, Brown AM, Luscombe GM, Wong SJ, and Mendis K. Antibiotic use for *Vibrio* infections: important insights from surveillance data. BMC Inf Dis. 2015 June 11; 15:226.
- Newton AE, Garrett N, Stroika SG, Halpin JL, Turnsek M, Mody RK, Centers for Disease Control and Prevention. Increase in *Vibrio parahaemolyticus* infections associated with consumption of Atlantic Coast shellfish—2013. MMWR Morb Mortal Wkly Rep. 2014 Apr 18;63(15):335–6.
- CDC. Notes from the Field: Increase in *Vibrio parahaemolyticus* infections associated with consumption of Atlantic Coast shellfish— 2013. MMWR. 2014;63:335–6.
- Slayton RB, Newton AE, Depaola A, Jones JL, Mahon BE. Clam-associated vibriosis, USA, 1988–2010. Epidemiol Infect. 2014 May;142(5):1083–8.