

PENNSYLVANIA DEPARTMENT OF HEALTH

2023– PAHAN –717 – 09-11 - ADV

Severe *Vibrio vulnificus* Infections in the United States Associated with Exposure to Coastal Waters

DATE:	9/11/2023
TO:	Health Alert Network
FROM:	Debra L. Bogen, MD, FAAP, Acting Secretary of Health
SUBJECT:	Severe <i>Vibrio vulnificus</i> Infections in the United States Associated with Exposure to Coastal Waters
DISTRIBUTION:	Statewide
LOCATION:	n/a
STREET ADDRESS:	n/a
COUNTY:	n/a
MUNICIPALITY:	n/a
ZIP CODE:	n/a

This transmission is a “Health Advisory” which provides important information for a specific incident or situation that may not require immediate action.

HOSPITALS: PLEASE SHARE WITH ALL MEDICAL, PEDIATRIC, INFECTION CONTROL, NURSING AND LABORATORY STAFF IN YOUR HOSPITAL

EMS COUNCILS: PLEASE DISTRIBUTE AS APPROPRIATE

FQHCs: PLEASE DISTRIBUTE AS APPROPRIATE

LOCAL HEALTH JURISDICTIONS: PLEASE DISTRIBUTE AS APPROPRIATE

PROFESSIONAL ORGANIZATIONS: PLEASE DISTRIBUTE TO YOUR MEMBERSHIP

Summary

- On September 1, 2023, the Centers for Disease Control and Prevention (CDC) issued [CDC Health Advisory 497](#) due to severe *Vibrio vulnificus* (*V. vulnificus*) infections in the United States associated with exposure to coastal waters.
- Since May 2023, there have been three Pennsylvania residents with *V. vulnificus* infections, all of whom were exposed to coastal water in the days leading up to disease onset.
- Providers should consider *V. vulnificus* as a possible cause of infected wounds that were exposed to coastal waters, particularly near the Gulf of Mexico or East Coast, especially during periods with warmer coastal sea surface temperatures.
- Rapid [diagnosis](#) and treatment with antibiotics and surgery for *V. vulnificus* skin infections increases survival.
- If you have any questions, please call Pennsylvania Department of Health (DOH) at 1-877-PA-HEALTH (1-877-724-3258) or your local health department.

Background

On September 1, 2023, the CDC issued [CDC Health Advisory 497](#) due to severe *Vibrio vulnificus* (*V. vulnificus*) infections associated with exposure to coastal waters in the United States during the months of July and August 2023. There have been three Pennsylvania residents with *V. vulnificus* infections reported during that same time period, all of whom traveled to other states and were exposed to coastal water in the days leading up to disease onset. The Pennsylvania residents did not report any other relevant exposures within Pennsylvania.

Vibriosis is a nationally notifiable disease. Report all *Vibrio* species (*V. vulnificus*, cholera, and all other non-cholera species) through DOH's web-based reportable disease surveillance system, [PA-NEDSS](#), or call DOH at 1-877-PA-HEALTH (1-877-724-3258) or the local health department. DOH requests that labs send all isolates (preferred) or positive stool specimens for all *Vibrio* species to the DOH Bureau of Laboratories for surveillance purposes. Shipment should occur Monday through Thursday only.

***Vibrio* isolates or specimens should be forwarded to
PADOH Bureau of Laboratories**

- Ship isolates at room temperature. Slanted media is preferred. If plates are sent, please seal with parafilm. Package as Category B sample and ship to the address below.
- Store and ship stool specimens at 2 to 8 °C. For Cary-Blair transport medium, add until medium reaches fill line. Ship to the address below.

PA Department of Health, Bureau of Laboratories
110 Pickering Way
Exton, PA 19341
610-280-3464

If you have additional questions about this guidance, please contact DOH at 1-877-PA-HEALTH (1-877-724-3258) or your local health department.

The full CDC HAN can be found here: [CDC Health Advisory 497](#). Pertinent excerpts are detailed below.

**Distributed via the CDC Health Alert Network
September 1, 2023, 12:30 PM ET
CDCHAN-00497**

Summary

The Centers for Disease Control and Prevention (CDC) is issuing this Health Alert Network (HAN) Health Advisory to:

- Notify healthcare providers, laboratories, and public health departments about recent reports of fatal *Vibrio vulnificus* (*V. vulnificus*) infections, including wound and foodborne infections.
- Urge healthcare professionals to consider *V. vulnificus* as a possible cause of infected wounds that were exposed to coastal waters, particularly near the Gulf of Mexico or East Coast, and during periods with [warmer coastal sea surface temperatures](#).
- Share important guidance for managing *V. vulnificus* wound infections.

Background

Vibrio are bacteria that cause an estimated 80,000 illnesses each year in the United States. About a dozen species of *Vibrio* are pathogenic to humans. *V. parahaemolyticus* causes the most infections in the United States, accounting for about 40% of reported cases of vibriosis, followed by *V. alginolyticus*, which accounts for about 20%. Most people with *Vibrio* infection have diarrhea. Some people might also have stomach cramping, nausea, vomiting, fever, and chills. One species, *V. vulnificus*, is known to cause life-threatening infections. About 150–200 *V. vulnificus* infections are reported to CDC each year and about one in five people with this infection die—sometimes within 1–2 days of becoming ill.

Vibrio naturally live in coastal waters, including salt water and brackish water, which is a mixture of salt water and fresh water. Most people get infected with *Vibrio* by eating raw or undercooked shellfish, particularly oysters. Some people get infected when an open wound is exposed to salt water or brackish water containing *Vibrio* [1]. People can also get infected if an open wound comes in contact with raw or

undercooked seafood. Open wounds include those from a recent surgery, piercing, tattoo, and other cuts or scrapes—including those acquired during aquatic activity. Extreme weather events, such as coastal floods, hurricanes, and storm surges, can force coastal waters into inland areas, putting people that are exposed to these waters—especially evacuees who are older or have underlying health conditions—at increased risk for *Vibrio* wound infections. This effect was observed in Florida after Hurricane Ian in 2022 [2].

Unlike other *Vibrio* species, *V. vulnificus* is primarily transmitted through open-wound contact with salt water or brackish water, but occasionally (in approximately 10% of cases) the bacteria also can infect people if they eat raw or undercooked shellfish. Person-to-person transmission has not been reported. People at higher risk for wound infection include those with underlying health conditions such as liver disease, diabetes, and immunocompromising conditions [3]. ***V. vulnificus* wound infections have a short incubation period and are characterized by necrotizing skin and soft tissue infection**, with or without hemorrhagic bullae. Many people with *V. vulnificus* wound infection require intensive care or surgical tissue removal.

***V. vulnificus* bacteria thrive in warmer waters—especially during the summer months (May to October) and in low-salt marine environments like estuaries.** In the United States, *V. vulnificus* infections have been most commonly reported by Gulf Coast states. However, *V. vulnificus* infections in the Eastern United States increased eightfold from 1988–2018, and the northern geographic range of infections has increased 48 km per year [4]. During July–August 2023, the United States has experienced above-average coastal sea surface temperatures and widespread heat waves [5]. During the same period, several East Coast states, including [Connecticut](#), [New York](#), and [North Carolina](#), have reported severe and fatal *V. vulnificus* infections. Many of these infections were acquired after an open wound was exposed to coastal waters in those states. Some of these infections were associated with consumption of raw or undercooked seafood or had unclear etiology.

Amid increasing water temperatures and extreme weather events (e.g., heat waves, flooding, and severe storms) associated with climate change [6], **people who are at increased risk for *V. vulnificus* infection should exercise caution when engaging in coastal water activities. Prompt treatment is crucial to reduce mortality from severe *V. vulnificus* infection.** CDC continues to monitor reports of *V. vulnificus* infections.

Diagnosis

- **Consider *V. vulnificus* as a possible cause of infection in wounds** that were exposed to coastal waters, especially in patients at higher risk for *Vibrio* infection, including those with underlying health conditions such as liver disease (including alcohol-associated liver cirrhosis), diabetes, and immunocompromising conditions [3].
- If *V. vulnificus* infection is suspected,
 - Obtain wound or hemorrhagic bullae cultures and send all *V. vulnificus* isolates to a [local, state, territorial, or tribal public health laboratory](#).
 - Blood cultures are recommended in addition to wound and hemorrhagic bullae cultures if the patient is febrile, has hemorrhagic bullae, or has signs of sepsis.
 - Ask the patient or family about relevant exposures, including whether they entered coastal water with an open wound; acquired a scratch or a cut while in coastal water; or had open-wound contact with raw or undercooked seafood.

Clinical Management

- Initiate treatment promptly. Early antibiotic therapy and early surgical intervention improve survival. Do not wait for consultation with an infectious disease specialist or laboratory confirmation of *V. vulnificus* infection to initiate treatment.
- Antibiotic therapy

- Doxycycline (100mg orally or intravenously twice a day for 7–14 days) and a third generation cephalosporin (e.g., ceftazidime 1–2g intravenously or intramuscularly every 8 hours) are recommended. [7]
- Alternate regimens include a third-generation cephalosporin with a fluoroquinolone (e.g., 500mg ciprofloxacin orally twice a day) or a fluoroquinolone given alone. [8,9].
- Children may also be treated with a combination regimen of a third-generation cephalosporin plus doxycycline or ciprofloxacin, or with an alternative regimen of trimethoprim-sulfamethoxazole plus an aminoglycoside [10]. In selecting a regimen, clinicians should be aware of guidance from the American Academy of Pediatrics:
 - Fluoroquinolones should not be used routinely as first-line agents in children younger than 18 years except when specific indications exist or in specific conditions for which there are no alternative agents (including oral agents) and the drug is known to be effective for the specific situation. [11]
 - Use of tetracyclines as a class of drugs in pediatric patients historically has been limited because of reports that this class could cause permanent dental discoloration in children younger than 8 years. More recent data suggest that doxycycline can be administered for short durations (i.e., 21 days or less) without regard to the patient's age. [12]
- Doses should be appropriately adjusted for renal and hepatic function.
- If appropriate, consult a microbiologist or infectious disease specialist.
- Give careful attention to the wound site. Necrotic tissue should be debrided. Severe cases might require aggressive debridement, fasciotomy, or amputation of the infected limb.

Clinical Reporting

- **Vibriosis is a nationally notifiable disease.** Healthcare professionals and clinical laboratories should report all cases to their local, state, territorial, or tribal health department.
- Healthcare professionals should consult their health department for guidance on when patients may return to childcare, school, or work.

Recommendations for the Public

Taking the following steps can help keep you safe:

- Stay out of salt water and brackish water if you have an open wound or cut. If you get a cut while you are in the water, leave the water immediately.
 - If your open wounds and cuts could come in contact with salt water, brackish water, or raw or undercooked seafood, cover them completely with a waterproof bandage.
 - Wash open wounds and cuts thoroughly with soap and clean, running water after they come in contact with salt water, brackish water, or drippings from raw or undercooked seafood.
- Cook raw oysters and other shellfish before eating.
- Always [wash your hands](#) with soap and water after handling raw shellfish.
- Seek medical attention right away for infected wounds.

[Learn more about how you can help protect yourself from *Vibrio*.](#)

For More Information:

- [Vibrio Species Causing Vibriosis](#)
- [Vibrio Information for Health Professionals & Laboratorians](#)
- [Emergency Wound Management for Healthcare Professionals](#)
- [Vibrio vulnificus and Wounds](#)
- [Vibrio and Oysters](#)

References

1. Baker-Austin C, Oliver JD, Alam M, et al. [Vibrio spp. infections](#). *Nat Rev Dis Primers*. 2018 Jul; 4(1): 1-19.

2. Soddors N, Stockdale K, Baker K, et al. [Notes from the Field: Vibriosis cases associated with flood waters during and after Hurricane Ian — Florida, September – October 2022](#). *MMWR Morb Mortal Wkly Rep*. 2023 May; 72(18): 497–98.
3. Baker-Austin C, Oliver JD. [Vibrio vulnificus: new insights into a deadly opportunistic pathogen](#). *Environ Microbiol*. 2018 Feb; 20(2): 423–430.
4. Archer EJ, Baker-Austin C, Osborn TJ, et al. [Climate warming and increasing Vibrio vulnificus infections in North America](#). *Sci Rep*. 2023 Mar; 13(1): 3893.
5. National Oceanic and Atmospheric Administration (NOAA). [Assessing the global climate in July 2023](#). 2023 Aug 14.
6. Intergovernmental Panel on Climate Change (IPCC). [Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change](#). 2023. Geneva, Switzerland, 1–34.
7. Liu JW, Lee IK, Tang HJ, et al. [Prognostic factors and antibiotics in Vibrio vulnificus septicemia](#). *Arch Intern Med*. 2006 Oct; 166(19): 2117–23.
8. Kim SE, Shin SU, Oh TH, et al. [Outcomes of Third-Generation Cephalosporin Plus Ciprofloxacin or Doxycycline Therapy in Patients with Vibrio vulnificus Septicemia: A Propensity Score-Matched Analysis](#). *PLoS Negl Trop Dis*. 2019 Jun; 13(6): e0007478.
9. Chen SC, Lee YT, Tsai SJ, et al. [Antibiotic therapy for necrotizing fasciitis caused by Vibrio vulnificus: retrospective analysis of an 8 year period](#). *J Antimicrob Chemother*. 2012 Feb; 67(2): 488–93.
10. American Academy of Pediatrics. Other *Vibrio* Infections. In: [Red Book: 2021–2024 Report of the Committee on Infectious Diseases, 32nd ed](#). 2021 January. Itasca, IL.
11. American Academy of Pediatrics. Fluoroquinolones. In: [Red Book: 2021–2024 Report of the Committee on Infectious Diseases, 32nd ed](#). 2021 January. Itasca, IL.
12. American Academy of Pediatrics. Tetracyclines. In: [Red Book: 2021–2024 Report of the Committee on Infectious Diseases, 32nd ed](#). 2021 January. Itasca, IL.

Individuals interested in receiving PA-HANs are encouraged to register at [HAN Notification Registration \(mir3.com\)](#)

Categories of Health Alert messages:

Health Alert: conveys the highest level of importance; warrants immediate action or attention.

Health Advisory: provides important information for a specific incident or situation; may not require immediate action.

Health Update: provides updated information regarding an incident or situation; unlikely to require immediate action.

This information is current as of September 11, 2023, but may be modified in the future.