

This is an official **CDC HEALTH ADVISORY**

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

Missouri healthcare providers please contact your local public health agency (LPHA) or the Missouri Department of Health and Senior Services' (DHSS) Bureau of Communicable Disease Control and Prevention at 573-751-6113 or 800-392-0272 (24/7) with questions regarding this CDC Health Advisory. Cases of vibriosis in Missouri are to be reported to your LPHA or DHSS.

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.

Recommendations for Healthcare Professionals

This guidance pertains to managing severe *V. vulnificus* wound 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.

Clinician 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 Laboratories

- Clinical laboratories should submit known or suspected *Vibrio* isolates to the local, state, territorial, or tribal public health laboratory.
- Local, state, territorial, and tribal public health laboratories should perform whole genome sequencing if possible and submit the results to [PulseNet](#).
- For laboratory questions or concerns, contact CDC at EntericBacteria@cdc.gov.

Recommendations for Public Health Officials

- Inform residents and tourists in coastal communities about the risk of *V. vulnificus* infection and protective actions.
 - Consider displaying signage, especially in coastline areas where people might come in contact with *Vibrio* in the water. CDC resources include information on [staying safe when visiting oceans, lakes, and rivers](#).
 - Consider redistributing CDC education materials about [food safety](#) and [preventing Vibrio infection](#).
 - Consider working with your infection prevention and control network and other partners to educate providers and people at high risk for *Vibrio* infections.
- Report all vibriosis cases through the [National Notifiable Diseases Surveillance System](#) (NNDSS) and submit completed [Cholera and Other Vibrio Surveillance \(COVIS\) forms](#) to COVISResponse@cdc.gov.

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.

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Categories of Health Alert Network messages

Health Alert	Conveys the highest level of importance about a public health incident.
Health Advisory	Provides important information about a public health incident.
Health Update	Provides updated information about a public health incident.