

OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

GOING VIRAL: ENTEROVIRUS D68 AND EBOLA

Stories abound in the press about the Ebola outbreak and the children sick with Enterovirus D68. This *CD Summary* reviews the epidemiology and public health recommendations regarding these viruses.

**ENTEROVIRUS D68**

Enterovirus D68 (EV-D68) is a small, single-stranded RNA “picornavirus,”\* a family with >100 other enteroviruses, the most notorious being poliovirus. Many enteroviruses are non-pathogenic or cause only a cold. EV-D68 may be spread by both fecal-oral and respiratory routes but has been associated almost exclusively with respiratory disease, ranging from mild to severe.<sup>1</sup> Despite the media buzz about it now, EV-D68 is not new; it was first identified in 1962. The recent spike in diagnosed cases may represent a true increase or merely increased recognition via more available EV-D68-specific testing.<sup>2</sup> Because it is not reportable, we lack data on the incidence of enterovirus infection in Oregon; but such infections are typically most common in late summer and early fall.

Two hospitals in Missouri and Illinois reported increases in pediatric ICU admissions for severe respiratory illness during mid-August and September, along with an increase in nasopharyngeal PCR tests indicating rhinovirus or enterovirus. Specimens from 30 patients with acute, severe respiratory symptoms from both facilities were submitted to CDC, where EV-D68 was found in ~80% of these patients. The infections were associated with pre-existing lung conditions, including asthma, and with age <5 years.<sup>3</sup> To date, 46 states and the District of Columbia reported 664 cases of severe respiratory illness caused by EV-D68 since mid-August.<sup>4</sup> There are lab-confirmed cases in Oregon. EV-D68 has been detected in specimens from 5 patients who died, none in Oregon.

Treatment is supportive; there is no specific antiviral therapy. If you

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identify a cluster of pediatric patients who develop acute respiratory illness requiring hospitalization, and testing finds no pathogen other than rhinovirus or enterovirus, give your local health department a call.<sup>†</sup> They will arrange for EV-D68 testing of specimens from selected patients at CDC.

**ECHOES OF POLIO**

Subsequently, nine children in Colorado were hospitalized with limb weakness or cranial nerve dysfunction associated with lesions of the brainstem or spinal cord on MRI, most about 2 weeks after a febrile respiratory infection. CDC detected EV-D68 DNA sequence by PCR in 4 of the 8 patient's nasopharyngeal swabs.<sup>5</sup> The possible connection between EV-D68 and neurological sequelae is new. If you have a patient <21 years of age with acute onset of focal limb weakness AND an MRI showing a spinal cord lesion largely restricted to the gray matter, please call your local health department.

**RESPIRATORY RELATIVITY**

EV-D68 isn't the only respiratory virus out there. Influenza kills an estimated 23,000 Americans annually. With flu season upon us, make sure to get yourself vaccinated, and recommend the same to your patients. Hand washing, cough etiquette, and staying home when sick can limit the spread of many respiratory pathogens. In healthcare settings, institute standard, contact, and droplet precautions.

**FOR MORE INFORMATION**

- <http://public.health.oregon.gov/DiseasesConditions/DiseasesAZ/Pages/disease.aspx?did=116#d68>

- [www.cdc.gov/non-polio-enterovirus/outbreaks/EV-D68-outbreaks.html?s\\_cid=cdc\\_homepage\\_whatsnew\\_001](http://www.cdc.gov/non-polio-enterovirus/outbreaks/EV-D68-outbreaks.html?s_cid=cdc_homepage_whatsnew_001)

**Ebola Outbreak: Worst Ever**

The outbreak of Ebola virus disease in West Africa is the largest since the virus was discovered in 1976. Transmission of the disease is ongoing in Guinea, Liberia, and Sierra Leone (Figure). To date, 8,033 cases have been reported — of which 4,461 have been laboratory-confirmed; 3,865 patients have died.

Figure. 2014 Ebola outbreak in West Africa



The limited outbreak in Nigeria, primarily involving healthcare workers after exposure to a case from Liberia, appears to be over. The Ebola outbreak in the Democratic Republic of the Congo (DRC) is unrelated to the West African outbreak. On September 30, 2014, the first Ebola case to be diagnosed in the U.S., in a traveler from Liberia, was announced by CDC.<sup>6</sup>

How the first case contracted the disease is unknown, but Ebola outbreaks are sustained by person-to-person transmission, which occurs only via broken skin or mucous membrane contact with the blood or bodily fluid from a symptomatic, infected person. The incubation period is 2–21 (typically 8–10) days after exposure. Symptoms may include acute onset of fever, malaise, myalgia, headache, vomiting and diarrhea. Standard, contact and droplet precautions (gloves, gown, mask, and eye shield) are effective at preventing the spread of Ebola.<sup>7</sup>

\* Get it? Small (pico) ma virus?

† [www.healthoregon.org/lhd](http://www.healthoregon.org/lhd), and click on “Local Health Department Directory”

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If transmission is so easily thwarted by personal protective equipment (PPE), why has this outbreak been so hard to control? Unfortunately, the affected countries lack sufficient health care infrastructure to care for all the patients, thus increasing exposures among non-infected persons who have to care for ill family members. Among some within the affected countries, washing the corpse of the deceased is a sacred practice that affords opportunity for further exposure. CDC and the U.S. Department of Defense (DoD) are working to establish Ebola Treatment Units to expand capacity to care for those infected, to improve care and limit transmission to health care personnel in existing facilities, to bolster surveillance for new cases and to follow persons potentially exposed.<sup>†</sup>The National Institutes of Health, DoD and Health and Human Services are working with companies to develop antibody preparations, antivirals and vaccines against Ebola.

### AND THE RISK TO OREGONIANS?

The likelihood of Ebola virus arriving in Oregon seems low given that few travelers have been in an affected part of Africa within an incubation period of arrival here. The likelihood of transmission here seems low, given that 1) patients aren't infectious before they get symptoms, 2) transmission requires intimate contact (see below) and 3) we have hospitals and PPE to care for patients.

If you have an asymptomatic traveler who has returned from one of the affected countries, ask about the following<sup>8</sup>:

† Godspeed, Malini!

- Percutaneous (e.g., needle stick) or mucous membrane exposure to blood or body fluids of Ebola patient
- Direct skin contact with, or exposure to blood or body fluids of, an Ebola patient without appropriate PPE
- Processing blood or body fluids of a confirmed Ebola patient without appropriate PPE or standard biosafety precautions
- Direct contact, without appropriate PPE, with a corpse in a country where an Ebola outbreak is occurring
- Household contact with an Ebola patient
- Other "close contact" with Ebola patients, defined as
  - being within ~3 feet or in the room or care area of an Ebola patient for a prolonged period while not wearing recommended PPE
  - having brief but direct contact (e.g., shaking hands) with an Ebola patient while not wearing recommended PPE

Note: Brief interactions, such as walking by a person or moving through a hospital, do not constitute "close contact."

Advise persons with any of these risk factors to self-monitor for fever or other symptoms for 21 days after the most recent exposure. Should the person develop symptoms during those 21 days, we would advise them to isolate themselves and to call their healthcare provider promptly. If you have such a patient, contact your local health department immediately (day or night).<sup>9</sup> Public health officials can facilitate testing at CDC and coordinate tracing of exposed persons should Ebola be confirmed.

We know how to stop Ebola: standard, contact and droplet precautions have stopped earlier outbreaks in Sudan, DRC, and Uganda. The problem in West Africa is that they haven't been able to fully employ these measures.

### FOR MORE INFORMATION

- [www.cdc.gov/vhf/ebola/hcp/patient-management-us-hospitals.html](http://www.cdc.gov/vhf/ebola/hcp/patient-management-us-hospitals.html)
- [www.cdc.gov/vhf/ebola/hcp/case-definition.html](http://www.cdc.gov/vhf/ebola/hcp/case-definition.html)
- [www.cdc.gov/vhf/ebola/index.html](http://www.cdc.gov/vhf/ebola/index.html)

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