When the country’s first case of Ebola appeared in Dallas in October, experts at the Minnesota Department of Health were surprised—not because the virus had finally made its way to the United States but because it showed up in Texas first.

“If you’d asked us weeks ago, ‘Where’s the first case going to be?’ a betting man would have said it would be here in Minnesota because we have such a large Liberian population,” says Rich Danila, Ph.D., deputy state epidemiologist. Currently, an estimated 25,000 Liberians reside in Minnesota, and most of them live in the northwestern quadrant of the Twin Cities metro area.

Danila and others in the Minnesota Department of Health’s epidemiology unit had watched as Ebola virus disease wreaked havoc in western Africa. By July, they realized the state needed to gear up, just in case. By the end of September, when the World Health Organization was reporting nearly 3,500 cases and more than 2,000 deaths in Liberia alone, they expected that someone flying from Liberia to Minnesota would be the first to bring Ebola to the United States.

I asked Danila and State Epidemiologist Ruth Lynfield, M.D., who take the lead during disease outbreaks in Minnesota, whether they thought the state was prepared for Ebola. Early in October, they thought we were. By the end of the month, after two nurses had contracted the virus, they said Department of Health staff were learning from the experiences in Texas, as well as in Atlanta and Omaha, and they were redoubling their efforts to ensure that Minnesota health care providers had the information and resources they needed to face Ebola.

**Q:** What have you been doing to get the state ready?

**LYNFIELD:** We have been giving a lot of presentations and providing information to health care providers, public health staff, laboratorians, health care facilities and the general public on preparing for Ebola. We have been keeping up with evolving issues and new guidelines, and we have been adapting our approach to incorporate new information as it comes out, posting it on our website.

We also have been working closely with and providing information to the Liberians who live in Minnesota, who, understandably, have a lot of questions and concerns about Ebola.

**Q:** What are you telling physicians and other health care providers?

**LYNFIELD:** That the really key question to ask patients up front is this: “Have you traveled in the past 21 days, and, if so, where?”

**DANILA:** Travel is so important in this world we live in. You could have been anywhere in the world two days ago and arrive here with a disease we normally wouldn’t have thought about 25 years ago.

**Q:** What are you telling hospitals?

**DANILA:** There’s a very good checklist for hospitals to go through to make sure they’re prepared for their first case of Ebola. It goes through the infection-control issues, the screening of patients, medical and laboratory issues, and communications. Also, we are emphasizing the importance of training staff on how to use the recommended personal protective equipment—specifically, how to put it on and take it off safely.

**Q:** Are physicians who work with people from Minnesota’s Liberian community especially concerned?

**DANILA:** We’ve received many calls. We’ve done grand rounds at North Memorial, which sees many people from Minnesota’s Liberian community and talked to physicians at North. They recognize they are the physicians most likely to encounter an Ebola case. About 10 weeks ago, we were getting a lot of calls from nursing homes about Liberians returning to work after visiting family in Liberia. I think a couple months ago we had more Liberians flying back and forth than we do now.
**Q:** Would an Ebola case be handled differently in Minnesota than it was in Texas?
**DANILA:** We hope with all the preparation we’ve done that we would have picked up on it the first time the patient went into the emergency department and not the second time. But you never know. It depends on what the patient tells you and what you know.

**Q:** If a case occurred here tomorrow, what would happen?
**LYNFIELD:** We expect that we would get a call from the physicians who are evaluating the patient. We’d go through how the patient is presenting, review clinical findings and what specifically the exposures were. If we think the patient does meet the criteria for testing for Ebola, we would facilitate testing. We would also review infection control and prevention guidelines with the health care providers.

**DANILA:** Minnesota’s public health lab is one of only about a dozen labs in the country, outside of the CDC, that can test for Ebola infection. The results would be back in six to eight hours.

**LYNFIELD:** The testing we would do in Minnesota would need to be confirmed by the CDC. If we think the patient may have Ebola, we would recommend that the person be isolated, and that the appropriate infection control procedures be used while tests are pending. It is important to know that during the first three days of symptoms, the PCR test may not be positive. So a follow-up test may be needed in someone presenting early in the course of their infection.

**Q:** Will only certain hospitals and certain physicians be handling Ebola patients here?
**DANILA:** Any hospital, clinic or urgent care must be prepared to identify a potential case because someone could present anywhere for care. Because patients infected with Ebola can become critically ill and may lose five to 10 liters of body fluids per day, it is becoming clear that these patients need special care in a facility that not only can provide critical care but also has a team that is proficient in the necessary infection control. What we have learned from the experience in Texas is that the health care providers taking care of these patients need to be very comfortable using the recommended personal protective equipment.

**LYNFIELD:** The mainstay of treatment is supportive care and meticulous infection control, although investigational therapies have been tried in some cases. The CDC has offered to help when a case is identified, including putting clinicians in touch with others who have experience in taking care of Ebola patients and sending a team to help. We would help facilitate this. However, infection control is key and health care providers need training and practice. All that said, discussion is occurring to identify facilities that will care for Ebola patients. Those facilities will have dedicated teams that are proficient in Ebola infection control and in clinical management.

**Q:** How should physicians protect themselves?
**LYNFIELD:** The CDC carefully reviewed the situation in Dallas and updated its guidance on personal protective equipment. Health care workers need respiratory protection with a PAPR or N95 respirator because infectious aerosols can be generated during the care of these patients. Also, they must wear an impermeable gown, two pairs of gloves, boot covers and an apron. Anyone taking care of Ebola patients must have repeated training and demonstrate competency in infection control practices and procedures; no skin should be exposed (there should be full body

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**RESOURCES FOR PHYSICIANS**

- Minnesota Department of Health Information on Ebola: www.health.state.mn.us/divs/idepc/diseases/vhf/index.html
- Guidance on Personal Protective Equipment to Be Used by Health Care Workers during Management of Patients with Ebola Virus Disease in U.S. Hospitals: www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html

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**CONTACT THE HEALTH DEPARTMENT**

State Epidemiology Program staff are available ‘round the clock, seven days a week. Call 651-201-5414.
CDC is continuing to review, assess and refine their recommendations on Ebola. Despite the occurrence of a few cases in the United States, we need to remember that conditions here are very different than conditions in Africa. We will not have an uncontrolled outbreak. Good, factual information is available, and we encourage physicians to become familiar with it. Also, we encourage physicians to call us if they have questions, and when they are evaluating someone who may have Ebola. Our staff is available 24/7. MM

Carmen Peota is an editor of Minnesota Medicine.

### DIAGNOSIS AND MANAGEMENT OF PATIENTS WITH SUSPECTED EBOLA VIRUS DISEASE

- Assess the patient for fever (subjective or \( \geq 100.4^\circ\text{F}/38.0^\circ\text{C} \))
- Determine whether the patient has symptoms compatible with Ebola virus disease such as headache, weakness, muscle pain, vomiting, diarrhea, abdominal pain or hemorrhage
- Assess whether the patient has a potential exposure from traveling to a country with widespread Ebola transmission or having contact with an Ebola patient in the 21 days before illness onset
- Suspect Ebola if fever or compatible Ebola symptoms and an exposure are present
- Consult with the Minnesota Department of Health about diagnostic EVD RT-PCR testing (651-201-5414)
- Consider, test for and treat (when appropriate) other possible infectious causes of symptoms (eg, malaria, bacterial infections)
- Provide aggressive supportive care including aggressive IV fluid resuscitation, if warranted
- Assess for electrolyte abnormalities and replete
- Evaluate for evidence of bleeding and assess hematologic and coagulation parameters
- Provide symptomatic management of fever, nausea, vomiting, diarrhea and abdominal pain
- Consult the health department about other treatment options

Source: CDC

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**Q:** What worries you most right now?

**DANILA:** One of the current problems we’re having is with clinical laboratories not wanting to do routine clinical tests on patients who might have Ebola. Patients returning from West Africa may have a number of conditions, and it is important to sort out the exposure and clinical history. We would not want someone with malaria, typhoid or other conditions to be missed. We are concerned that clinical tests on a known patient won’t be done because of the laboratories’ concerns.

**LYNFIELD:** Another worry is that the media coverage about Ebola is leading people in the United States to amplify the risk. We’ve already seen negative consequences such as school closings because of misunderstanding about transmission of Ebola and fear. The best thing we can do to control Ebola in this country is to control it at the source, which is in Africa. This outbreak is having enormous consequences for the involved countries that will have a long-term impact. We need to do everything we can to help them.

**Q:** What do physicians need to know about Ebola that they might not?

**LYNFIELD:** Ebola is a really scary disease, and we never expected to encounter it in the United States. However, we have excellent tools at our disposal. Several medical centers are already experienced in treating Ebola patients safely, and they are sharing their procedures and approaches. The

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