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Slide 2-Presentation Title

Hello. My name is Nicole Lee and I'm going to share some information about Shigellosis and how to respond when Shigella has been identified.

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The learning objectives for this presentation include:

- Being able to recognize and best respond at the beginning of an outbreak of Shigellosis
- A second objective is for you to be able to locate resources to manage a Shigellosis outbreak in a child care facility, which is where we can often see a rapid transmission rate.
- A third objective if for you to be able to identify three control measures to prevent secondary cases in a child care facility. This objective is an important one given the rapid transmission rate within child care facilities mentioned earlier.

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Here's an overview of the topics we'll cover during this presentation:

We will look at the clinical picture of Shigellosis, the illness caused by Shigella, as well as the case definition.

In terms of an outbreak situation, we will talk about recognizing when there is an outbreak and the appropriate response for various scenarios.

We will end with the resources available to you as you respond to cases of Shigella and related outbreaks.

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Let's begin by describing the illness itself.

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Shigellosis is the illness caused by the bacterium *Shigella*. There are four serogroups of *Shigella*.

- *Shigella dysenteriae* is the most severe form of *Shigella* infection, but thankfully, we rarely see that serogroup here in the US. *Shigella boydii* and *flexneri*, along with *dysenteriae*, account for most isolates from developing countries.
- But, here in the US we see *Shigella sonnei* most often. It is the most common *Shigella* serogroup in industrialized countries. We see *Shigella sonnei* in NC most often and *Shigella flexneri* less often.

Shigellosis is characterized by diarrhea, fever, nausea, cramps and tenesmus, which is the feeling of having to defecate even though the colon is empty. Some asymptomatic infections may occur.

The incubation period (the time from exposure to the first signs of symptoms) is 1 – 4 days.

Most infections with *Shigella sonnei* last 48-72 hours.

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Shigella is highly contagious which is why our control measures have to be swift and thorough to try to reduce transmission as quickly as possible.

As illustrated here, it does not take much to make someone ill. As few as 10 *Shigella* bacterium can cause illness and as many as 400 can fit on the head of this pin.

The reservoir for *Shigella* (which is the habitat in which the agent normally lives, grows, and multiplies) are humans.

The mode of transmission is fecal-oral. People can become ill from contaminated food or beverage as well as from person to person contact.

Secondary attack rates in households can be up to 40%, which means that almost half of the people in the home with a case will likely become ill.

These characteristics of *Shigella* requiring a low dose to make someone ill and being transmitted via the fecal-oral route is why hand washing is the most important message to communicate. Individuals primarily responsible for transmission include those who fail to clean hands and under fingernails thoroughly after defecation.

In addition, enhance environmental cleaning for childcare and school facilities. Clean the classroom, toileting and food preparation areas in affected class using approved disinfectant. Inanimate objects such as toys, doorknobs, tables, etc. may be contaminated with *Shigella*.

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Now, let's talk about case classifications.

A confirmed case of *Shigella*, according to the current case definition, is a person who has tested positive for *Shigella* by culture.

A probable case of *Shigella* is a person with a clinically compatible illness who is epi-linked. Epi-linked means the case is a contact of a confirmed case or a member of a risk group defined by public health authorities during an outbreak.

A suspect case is one where the *Shigella* organism has been identified through a non-culture method, like PCR.

All three classifications require implementation of control measures and completion of the *Shigella* questionnaire.

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Before we move on to recognizing and responding to an outbreak, I want to mention what you would do for one case of *Shigella* regardless of whether or not you currently have an outbreak.

Anyone who is lab confirmed for *Shigella* cannot return to child care (both workers and attendees), health care, or food handling until that person is asymptomatic AND has negative stool cultures (the first of which cannot be collected sooner than 48 hours after last antibiotic dose, if applicable, and no sooner than 24 hours between each specimen).

Symptomatic contacts should be excluded from these high risk occupations as well until two negative stool cultures are collected.

Consult with your local environmental health staff person for further detail on food handling restrictions in those who are contacts to confirmed cases.

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Shigella cases cannot return to childcare facilities or high risk occupations until they are asymptomatic AND have had a negative lab result. Having one negative stool culture for

childcare attendees to return to their facilities is a change based on conversations the communicable disease branch has had with CDC discussing the current evidence regarding Shigella testing. This negative result can be from a PCR test or a culture for childcare attendees. Keep in mind that PCR tests are very sensitive. A PCR test may even detect organisms that are not viable and would not grow if that same sample was cultured.

Two negative stool cultures are required of childcare workers, healthcare workers or food employees according to the APHA manual.

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Now let's move on to being able to recognize and respond to an outbreak of Shigella

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If one confirmed case of Shigella is identified in a child care facility, this could be the early warning sign of something big on the horizon. While this is not an outbreak, it is VERY important to immediately and thoroughly enforce control measures.

Should you have resistance from a child care owner in implementing control measures, contact your local child care licensing consultant for assistance.

In addition to exclusion of the confirmed case, as mentioned in a previous slide, additional control measures such as increased hand washing, environmental cleaning and no new admissions have to occur. There should be no new admissions until public health can ensure that this is a single isolated case and not an outbreak. In order to do that, a letter should go home to staff and parents asking if they have had any illness in the two weeks prior to the confirmed case. In addition, parents and staff should be assessed daily (for one week) for onset of GI illness. If there are no reports of illness during that week, then we can feel comfortable that the confirmed case is an isolated incident, there is no active outbreak, and new admissions along with other previous activities can resume.

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If two or more culture confirmed cases of Shigella are identified in a child care facility, this is an outbreak.

In addition to the previous control measures, a letter should be sent home to parents to make them aware of the outbreak. Laboratory testing of direct contacts to the confirmed cases should occur to rule out asymptomatic shedders.

These control measures need to be enacted immediately and people need to be accountable to ensure they are consistently complying with these control measures.

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There are times when a community outbreak of Shigella is established. This can occur when multiple facilities in the county are experiencing confirmed, probable, and/or suspect cases.

The control measures during times of community outbreaks are the same as previous – the only difference is that they are triggered by a single case of diarrhea with no alternative diagnosis, instead of waiting until someone is culture confirmed or PCR positive for Shigella.

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The Shigella toolkit has been updated in light of recent Shigella outbreaks in multiple counties in the state. It is located online in the “Diseases & Conditions Reportable in North Carolina” section of the North Carolina Communicable Disease Manual.

Many thanks to state and local health department staff and partner agencies for sharing their experiences to make this tool kit useful to our stakeholders.

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The take home message for Shigella is HAND WASHING, HAND WASHING, HAND WASHING!

Shigella is transmitted by the fecal-oral route and humans are the reservoir so hand washing can never be over emphasized.

Because such a low infectious dose is required to make someone ill, it is important that spread is prevented through hand washing, especially under the nails. Proper diapering and toileting practices are fundamental. Wash hands after diapering and toileting, and before preparing and eating food.

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Let’s take a moment to review what we’ve learned from this presentation.

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While 2 PCR positive or culture confirmed cases in one facility is the trigger for an outbreak, remember the importance of immediate and thorough enforcement of control measures for even one case because it may be the warning sign of something much bigger on the horizon if changes aren't made.

The Shigella Outbreak Toolkit is an excellent resource located in the CD manual. There you will find investigation steps, control measures, letter templates, and more.

Because Shigella is so easily transmissible and it only takes a little bit to make someone sick: hand washing cannot be over emphasized! Exclusion of ill and environmental cleaning are two other important control measures.

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This concludes the presentation on Shigella outbreak investigations. And remember, your TATP nurse and the communicable disease branch are available to answer questions and provide technical assistance as needed. You can reach the epidemiologist on call at 919-733-3419. Thank you for your time and good luck with your outbreak investigations!