7 Why is contact tracing so important?

CDC NERD Academy

Grade level: 6–12

Suggested time: 75 minutes

Overview

In this module, students learn about the role of case investigations and contact tracing in investigating disease outbreaks. Using details from an outbreak investigation of a fictional, novel emerging respiratory disease (NERD), students calculate the incubation and infectious period for known cases. Then, they use this information to make evidence-based recommendations.

Learning objectives

After this module, students should be able to

- Explain the role of case investigations and contact tracing in investigating outbreaks
- Distinguish among presymptomatic, symptomatic, and asymptomatic disease
- Explain the association among exposure, incubation period, and infectious period
- Use patterns in case and contact data to summarize the spread of NERD on a trace map
- Make evidence-based recommendations for self-isolation for a person with a case of NERD and self-quarantine for close contacts to help reduce the spread of NERD

STEM connections & standards

STEM connections: Science: microbiology; Math: interpreting patterns

Problem-based skills: Identifying trends, decision making, implementing action plans, collaborative performance

Epidemiology and Public Health Science Core Competencies: HS-EPHS1: Epidemiologic Thinking and a Public Health Approach
https://www.cdc.gov/careerpaths/k12teacherroadmap/pdfs/ephs-competencies.pdf

National Health Education Standards: Standard 5: Students will demonstrate the ability to use decision-making skills to enhance health. Standard 7: Students will demonstrate the ability to practice health-enhancing behaviors and avoid or reduce health risks. Standard 8: Students will demonstrate the ability to advocate for personal, family, and community health.
https://www.cdc.gov/healthyschools/sher/standards/index.htm

Next Generation Science Standards: Science & Engineering Practice(s): Asking Questions and Defining Problems; Planning and Carrying Out Investigations; Obtaining, Evaluating, and Communicating Information; Constructing Explanations and Designing Solutions Crosscutting Concept(s): Cause and Effect **http://www.nextgenscience.org/get-to-know**

Timeline

1 Introducing the content (30 minutes)

Students watch the "Why is contact tracing so important?" video (12:29 minutes) to learn about case investigations and contact tracing. Teachers can assess student knowledge of the video content using the **Knowledge Check**. The class can further discuss the role of a public health nurse using the **Career Spotlight**.

2 Activity (35 minutes)

In this collaborative activity, students role play key characters during a case investigation and conduct contact tracing with people involved in a possible NERD outbreak. Students analyze the interactions between each character by date and incubation and calculate infectious periods to make recommendations for self-isolation for infected people or self-quarantine for close contacts. Teachers can watch an activity demonstration video (2:54 minutes) that illustrates how to teach this activity in the classroom.

3 Class discussion (10 minutes)

As a class, students apply their knowledge to answer questions about why case investigations and contact tracing are important.

Vocabulary

Asymptomatic, case investigation, close contact, contact tracing, exposure, incubation period, infectious period, presymptomatic, privacy, self-isolation, self-quarantine, symptomatic, trace map.

See **Definitions**.

Materials

Handouts and white poster paper or graph paper.

Meet Pavati, a public health nurse

Learn more about a public health nurse's role in the **Career Spotlight** and the "Why is contact tracing so important?" video.

Teacher preparation

- Preview videos.
- Make copies of handouts.
- Cut out **Character Cards**.
- Make copies of the **NERD Factsheet** (one per group) or an enlarged classroom version.

> The **NERD Factsheet** is not required for this lesson but may be useful as a reference.

> The **NERD Factsheet** may be re-used across modules if previously distributed to students.

Videos

- "Why is contact tracing so important?" video (12:29 minutes) for students
- Activity demonstration video (2:54 minutes) for teachers

www.cdc.gov/scienceambassador/nerdacademy/contact-tracing.html

Handouts

- **Knowledge Check: Contact Tracing** (one per student)
- **Career Spotlight: Public Health Nurse** (one per student or one classroom copy)
- **Character Cards** (one set per group)
- **Case Investigation & Contact Tracing Guide** (one per student)
- **Interview Outline** (optional)
- **Interview Notes** (one per student)
- **Trace Map** (one per student)

Introducing the content (30 minutes)

Say aloud

During this video, you will learn how conducting a case investigation and contact tracing can help reduce disease transmission for contagious diseases where timely intervention can reduce the spread of disease. Case investigators and contact tracers, who are sometimes public health or school nurses, collect then organize data using trace maps to help track and identify patterns in disease spread. They also recommend control measures, such as self-isolation for people with either a positive test or signs and symptoms of the disease and self-quarantine for contacts. Throughout, they take steps to protect patient privacy and maintain confidentiality of the information they collect.

1. Show the "Why is contact tracing so important?" video (12:29 minutes) to students.
2. Hand out the **Knowledge Check: Contact Tracing**. Allow students 3–5 minutes to answer the questions on their own. Then, review as a class using the **Knowledge Check: Answer Key** provided.
3. Hand out or display the **Career Spotlight**. Discuss the role of a public health nurse.

Activity (35 minutes)

Say aloud

In this activity, you will role play different people involved in a fictional story designed to introduce you to case investigations and contact tracing. You will be part of a NERD case investigation and assigned a role as either a contact tracer, a person with a confirmed case of NERD, or a person who has had close contact with another person confirmed to have a case of NERD. As you and your peers role play interviews with the characters, listen carefully to each interview and keep track of the answers people give so that you can eventually calculate incubation and infectious periods, provide information to contacts about self-quarantine and self-isolation, and map the spread of NERD through this community.

1. Divide students into groups of 5–10. Hand out the **Case Investigation & Contact Tracing Guide**. As a class, read the overview on case investigation and contact tracing. As a class, demonstrate how to calculate the incubation and infectious period for NERD. Review how to make recommendations using this information.

2. Choose one student to lead the activity in each group as the contact tracing supervisor — provide this student with the contact tracing supervisor card. Instruct the remaining students to choose a character to play from the **Character Cards**. If there are less than 10 students in a group, have some students play more than one character role.

> There are 10 roles in this activity: eight characters, a contact tracer, and a contact tracing supervisor. The contact tracing supervisor is the lead for this case investigation, which requires additional responsibility for the student role playing this character. The contact tracer will be following the guide but must be at ease speaking up and asking questions.

> Alternative to a group activity, this can be done as a whole-class activity with multiple students taking turns as the contact tracer and the teacher as contact tracing supervisor.

3. Hand out the **Interview Notes** handout. Explain that they should keep track of key dates and character information using their worksheet when each “character” is interviewed. Provide the **NERD Factsheet** for additional reference.

4. Assign students to work through Part 1: Case Investigation in the **Case Investigation & Contact Tracing Guide**. If students need additional guidance on identifying who to interview next, provide them with the **Interview Outline** (optional). Important dates and details, such as the calculated incubation period and infection period for each character, are provided in the **Interview Notes: Answer Key** as a guide.

5. Hand out the **Trace Map** handout. Have students summarize the information from the case investigation by creating a trace map. For example, start with a box labeled “LaTanya – July 5”. Then, create two branches labeled “lives with.” Use the **Trace Map Answer Key** as a guide.

6. Have students work together to answer the discussion questions. As a class, review the discussion questions using the **Trace Map Answer Key** as a guide.

Class discussion (10 minutes)

- How does case investigation and contact tracing slow the spread of disease? Use this scenario to describe what could have happened if a person with a case of NERD did not self-isolate and their contacts did not self-quarantine.
- Why are trace maps helpful tools for case investigation and contact tracing?
- How might the questions a contact tracer asks during a case investigation change when investigating different infectious diseases?

Definitions

Asymptomatic (person): A person who has been infected with an infectious agent (such as a virus) who does not experience symptoms of disease during the infection. An asymptomatic person can still spread disease.

Case investigation: Part of the process of supporting people with suspected or confirmed infection in which public health staff work with a person to help them recall everyone with whom they have had close contact during the time frame while they might have been infectious.

Close contact: Someone who was physically close to a person who was potentially infectious. For NERD, a close contact is defined as anyone who was within 6 feet of an infected person for a total of 15 minutes or more.

Contact tracing: The identification, monitoring, and support of a person who has been exposed to, and possibly infected with an infectious agent, such as a person who came in close contact with a person with a confirmed or probable case of disease.

Exposure: Contact with something that causes, or having a factor that influences, a particular health problem. Exposures can be disease-causing (e.g., infectious agent or ultraviolet radiation) or preventative (e.g., sunscreen).

Incubation period: The time between when a person is exposed to an infectious agent and when they begin to develop symptoms.

Infectious period: The time when a person is able to pass the virus to others.

Presymptomatic (person): A person who has been infected with an infectious agent (such as a virus) and does not yet show any symptoms of disease but will go on to develop symptoms. A presymptomatic person can still spread disease.

Privacy: The duty to protect a patient's sense of being in control of the access others have to their experiences, behaviors, or thoughts. Privacy deals with people (e.g., healthcare workers should not share the

Self-isolation: The practice used to keep a person who is currently infected with an infectious agent (such as a virus) away from others during their infectious period to prevent transmission of an infectious disease.

Self-quarantine: The practice used to keep a person who may have been exposed to an infectious agent (such as a virus) away from others while they monitor themselves for signs of illness during their potential infectious period to prevent possible transmission of an infectious disease.

Symptomatic (person): A person who has been infected with an infectious agent (such as a virus) and is showing symptoms of disease. A symptomatic person can spread disease.

Trace map: A visual or model that displays how a disease spreads from person to person in a community or population.

For more vocabulary, visit: **https://www.cdc.gov/scienceambassador/nerdacademy/glossary.html**.

Extension Ideas

- Have students research infectious diseases using the CDC website. Have them create timelines showing date of exposure, incubation period, infectious period, onset date of symptoms, and duration of illness, if not asymptomatic.
- Have students create a public service announcement (PSA) that explains the importance of the incubation period and infectious period for reducing the spread of disease. Assign students a specific type of media (e.g., social media post, infographic, fliers, TV news spot, commercial, video, podcast) and audience (e.g., children, teenagers, university students, parents, older people) for their PSA. For examples, see COVID-19 Contact Tracing Communications Toolkit for Health Departments: **https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing-comms.html**.

Resources

CDC Resources

Case Investigation and Contact Tracing
https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/contact-tracing.html
https://www.cdc.gov/coronavirus/2019-ncov/php/principles-contact-tracing.html
https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/contact-tracing-resources.html

Confidentiality and Consent
https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/Confidentiality-Consent.html

Contact tracing in K-12 schools
https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/contact-tracing.html.

Monitoring the Disease
https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/about-epidemiology/monitoring-and-tracking.html

Self-Isolation and Self-Quarantine Home Assessment Checklist for Coronavirus Disease 2019 (COVID-19)
https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/self-quarantine_form.pdf

Studying the Disease
https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/about-epidemiology/studying-the-diesease.html

Other Resources

Privacy and Confidentiality **https://research.uci.edu/compliance/human-research-protections/researchers/privacy-and-confidentiality.html**.

The CDC NERD Academy curriculum was developed by the Centers for Disease Control and Prevention's (CDC's) Science Ambassador Fellowship (SAF) program. Support for the curriculum is made possible through a partnership between the CDC Foundation and CDC. Videos for the curriculum were developed and produced by Osmosis.

Disclaimer: NERD (novel emerging respiratory disease) is a fictional disease created for this curriculum. NERD etiology, data, events, and information presented in the CDC NERD Academy curriculum are loosely based on the understanding of COVID-19 prior to a vaccine becoming available. Some details have been generalized for educational purposes.

Knowledge Check: Contact Tracing

Directions: After watching the "Why is contact tracing so important?" video (12:29 minutes), answer the following questions.

1 Which of the following best explains contact tracing? (Choose the best answer)

a. A process in which public health workers interview people with an infectious disease in order to tell their close contacts who may have infected them.

b. A process in which public health workers identify close contacts of people with an infectious disease to monitor them for disease and see that they get appropriate follow-up.

c. A strategy that keeps someone who may have been exposed to an infectious agent away from others.

d. A strategy that keeps someone who is infected with an infectious agent away from others.

2 How does contact tracing help reduce the spread of an infectious disease? (Choose the best answer)

a. Incubation periods and infectious periods may be calculated to provide a specific timeframe in which to identify contacts who are at risk of getting the disease.

b. Close contacts exposed to an infectious agent can be notified to self-quarantine, which may prevent them from spreading the disease to others.

c. The source of the infectious agent may be identified, and that information may be used to help prevent the spread of disease.

d. All of the above.

3 Determine if the following statements are true or false.

True	False

Fill in the blank	Example
	Self-quarantine is used to keep someone who is infected away from others.
	An incubation period is the time between when a person is exposed to an infectious agent and when they begin to develop symptoms.
	A person with an infectious disease can only infect others if they have symptoms of disease.

4 Explain the connection between the terms infectious period, exposure, confirmed case, and contact.

Knowledge Check: Answer Key

Directions: After watching the "Why is contact tracing so important?" video (12:29 minutes), answer the following questions.

1 Which of the following best explains contact tracing? (Choose the best answer)

a. A process in which public health workers interview people with an infectious disease in order to tell their close contacts who may have infected them.

b. A process in which public health workers identify close contacts of people with an infectious disease to monitor them for disease and see that they get appropriate follow-up. **(Correct answer)**

c. A strategy that keeps someone who may have been exposed to an infectious agent away from others.

d. A strategy that keeps someone who is infected with an infectious agent away from others.

2 How does contact tracing help reduce the spread of an infectious disease? (Choose the best answer)

a. Incubation periods and infectious periods may be calculated to provide a specific timeframe in which to identify contacts who are at risk of getting the disease.

b. Close contacts exposed to an infectious agent can be notified to self-quarantine, which may prevent them from spreading the disease to others.

c. The source of the infectious agent may be identified, and that information may be used to help prevent the spread of disease.

d. All of the above. (Correct answer)

3 Determine if the following statements are true or false.

True	False

Fill in the blank	Example
False	Self-quarantine is used to keep someone who is infected away from others.
True	An incubation period is the time between when a person is exposed to an infectious agent and when they begin to develop symptoms.
False	A person with an infectious disease can only infect others if they have symptoms of disease.

4 Explain the connection between the terms infectious period, exposure, confirmed case, and contact.

Answer: During the infectious period, a person with a confirmed case of a disease can expose people they come in close contact with to the infectious agent and possibly transmit it to them. The people potentially exposed to the infectious agent are called close contacts.

Career Spotlight

CDC NERD Academy

Public Health Nurse

A public health nurse plays a vital role in disease prevention and promoting community health and safety. They look at health trends, identify health risk factors, and work towards improving access to health services for all communities. They also work with the health department and healthcare facilities to design and implement health education campaigns and disease prevention activities.

Meet Pavati, a public health nurse

Who do they work with?

Public health nurses collaborate with different professionals, including healthcare administrators (e.g., the people who run hospitals and clinics) and local, state, and federal public health officials.

Where do they work?

Public health nurses work in many settings, such as community healthcare clinics, schools, local and state health departments, and federal and international public health agencies, including the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO). Some public health nurses even go to people's homes to provide care and education.

What skills do they use?

Public health nurses have excellent clinical skills, communication skills, interpersonal skills, analytical skills, and can collaborate with different professionals. They also have problem solving skills and an ability to adapt. Public health nurses must not only know the science of the disease but must also understand the community in which they work to gain people's trust and communicate in an effective and culturally-relevant way.

What qualifications do they need?

Public health nurses are registered nurses (RNs) who have a Bachelor of Science in Nursing (BSN) degree or an Associate Degree in Nursing (ADN). Nurses with an advanced degree of Master of Science in Nursing (MSN), Doctor of Nursing Practice (DNP), or a Doctor of Philosophy (PhD) can expand their public health nursing capacity to include additional clinical, leadership, or research roles.

NERD Factsheet

CDC NERD Academy

What is NERD?

NERD is a fictional novel emerging respiratory disease caused by a virus that can spread from person to person. NERD symptoms can range from mild (or no symptoms) to severe illness and death.

Who can get NERD?

- People of any age can get NERD, even healthy young adults and children.
- People who are older or have certain underlying medical conditions are at higher risk of getting very sick from NERD.
- Other groups may be at higher risk for getting NERD or having more severe illness.

What are the symptoms of NERD?

Symptoms may appear 2–14 days after exposure to the virus. People with these symptoms may have NERD:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

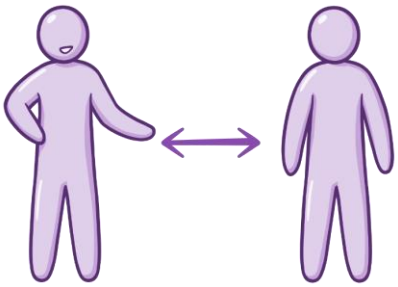
What do I do if I have symptoms?

- Stay home except to seek medical care. Separate yourself from other people.
- Get tested. If you test positive, tell your close contacts that they may have been exposed to NERD.
- You can be with others after at least 10 days since your symptoms first appeared and at least 24 hours with no fever.

Be aware of the signs of severe disease, including trouble breathing, pain or pressure in the chest, confusion, or trouble waking or staying awake. If someone is showing any of these signs, seek emergency medical care immediately.

How does NERD spread?

NERD **most commonly** spreads during direct, close contact:



- When people have direct contact with a person with NERD.
- When a person with NERD releases respiratory droplets when they cough, sneeze, sing, talk, or breathe, and these droplets are inhaled by another person who is physically near (within 6 feet).

NERD **sometimes** spreads through airborne transmission, especially indoors:

- When a person with NERD breathes heavily — such as when exercising, singing, or shouting — they can produce more respiratory droplets that can linger in the air for minutes to hours.

NERD is **less commonly** spread through contact with contaminated surfaces.

- When a person touches a surface or object with the virus on it and then touches their mouth, nose, or eyes.

What if I have been in close contact with someone with NERD?

Close contact is defined as being within 6 feet of a NERD-positive individual for a total of 15 minutes or more.

- Separate yourself from other people. A person infected with NERD can spread the virus starting 48 hours, or 2 days, before the person feels any symptoms or tests positive.
- Watch for symptoms until 14 days after exposure.
- If you do not have symptoms, you can be with others 14 days after your last contact with someone with NERD.
- If you have symptoms, you can be with others after at least 10 days since your symptoms first appeared and at least 24 hours with no fever.
- Get tested. If you test positive and have no symptoms, you can be with others after 10 days have passed since the date you had your positive test.

1. Wear a mask to protect yourself and others and stop the spread of NERD.
2. Stay at least 6 feet (about 2 arm lengths) from others who don't live with you.
3. Avoid crowds. The more people you are in contact with, the more likely you are to be exposed to NERD.

Character Cards

William

Contact Tracer

- Is a trained public health nurse
- Works for local health department as a case investigator and contact tracer

You will read the contact tracer sections of Case Investigation & Contact Tracing Guide but can also ask additional questions.

Ishika

Contact Tracing Supervisor

- Is an epidemiologist
- A team lead for this case investigation

You will read the contact tracing supervisor sections of Case Investigation & Contact Tracing Guide and help guide interview decisions.

Jenn

- Is a 50-year-old female
- Lives with son (Colin) in Atlanta, Georgia
- Developed symptoms on July 23
- Her son, Colin, was sick
- More severe symptoms caused her to go to the hospital on July 31, and she tested positive for NERD
- Has not left the house since May 15

Colin

- Is an 18-year-old male
- Lives with mom (Jenn) in Atlanta, Georgia
- Played soccer with friends (Deion and Chayton) on July 10
- Not too worried about getting sick because he is young and healthy
- Has left the house only once since May 20 and is eager to be with friends
- Developed a fever on July 21 followed by mild symptoms; feeling better now
- His mom tested positive

Deion

- Is an 18-year-old male
- Lives with mom (LaTanya) and twin brother (Denzel) in Decatur, Georgia
- Developed a fever of 101°F on July 10
- Mostly feeling better now
- Played soccer with friends (Chayton and Colin) on July 10
- Has left the house once since May
- His mom (LaTanya) is now sick and he is worried about her because she has been sick for a while

Ralph

- Lives in Tucker, Georgia
- Lives with his wife who is not ill
- Went fishing with Kangee on July 25
- Went to his office in Atlanta several times the week of July 27–August 3 and interacted with a few colleagues
- A colleague with whom he interacted got sick. He didn't want to get tested because he felt fine. His wife was worried and he agreed to take a test
- His test results came back on August 5 and they were positive

Kangee

- Is a 50-year-old male
- Lives with son (Chayton) in Tucker, Georgia
- His son (Chayton) was sick
- Went fishing with Ralph on July 25
- Developed a cough on July 25, later developed a fever and other mild symptoms
- He is still sick

Chayton

- Is an 18-year-old male
- Lives with dad (Kangee) in Tucker, Georgia
- Played soccer with friends (Deion and Colin) in Decatur, Georgia, on July 10
- Has not seen anyone else since May
- Started feeling sick on July 15, but never felt he needed to see a doctor
- He is feeling better now
- His dad (Kangee) is sick. He had a fever on July 21 followed by mild symptoms; feeling better now

His mom tested positive

LaTanya

- Is a 52-year-old woman
- Lives with sons (Deion and Denzel)
- Her son, Deion, was sick
- Developed fever on July 5; she is still sick
- Starting in April, she has only left the house on Saturday mornings to go grocery shopping where she often chats with other shoppers about deals, new items, and coupons

Denzel

- Is an 18-year-old male
- Lives with mom (LaTanya) and twin brother (Deion) in Decatur, Georgia
- Has not left the house since early May
- Mostly stays in room playing video games
- Has not been sick
- His mom (LaTanya) is sick
- His brother (Deion) was sick, but he recovered quickly

Case Investigation & Contact Tracing Guide

Directions: The NERD virus has started to spread through your community. To help reduce the spread, you will be conducting a case investigation and contact tracing. Review how NERD spreads and the symptoms of NERD using the **NERD Factsheet**.

You will be assigned 1 of 10 roles and be given a character card. Do not show anyone your character card. You will act out your assigned character using this guide. If you are assigned Ishika, the contact tracing supervisor, or William, the contact tracer, you will help lead the investigation.

Use this guide to help you with the case investigation and contact tracing. The case investigation and the first interview for contact tracing have been scripted to help you get started. After that, it will be up to your group to conduct the contact tracing. As the investigation plays out, be sure to write down important information shared by each character on your **Interview Notes** handout.

As a reminder, for this activity, assume that there is limited access to NERD testing and there is no vaccine available yet.

What is case investigation and contact tracing?

Case investigation and contact tracing can help reduce disease transmission.

To do this, case investigators and contact tracers collect information such as the date when symptoms started and estimated date of exposure (if known) to calculate the *incubation period* and *infectious period*.

This information also allows them to map the spread of disease and to recommend control measures, such as self-isolation for people with a case of disease and self-quarantine for close contacts. Below is a contact tracing workflow to learn how contact tracing can be done.

What is the incubation period for NERD?

The NERD virus has an ***incubation period of 2–14 days.*** This means it takes 2–14 days from the time someone is exposed for them to start showing symptoms of NERD. People can be infectious 2 days before showing symptoms. Current evidence shows that some people can be infectious without showing symptoms (i.e., they are asymptomatic).

To determine the maximum incubation period, count 14 days before the start of first symptoms. **For example, if symptoms began on July 15, the incubation period would start on July 1.**

Determining the incubation period is important because it is the timeframe that a person who has a case of NERD was infected.

What is the infectious period for NERD?

To determine the infectious period, count 2 days before the start of symptoms. **For example, if symptoms began on July 15, the infectious period would start on July 13.**

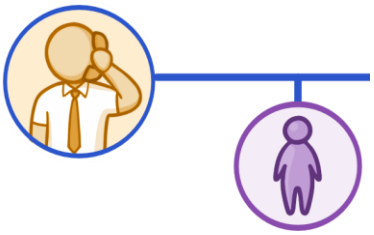
Determining the infectious period is important because that is the timeframe that a person can infect others.

How do I make recommendations?

The recommendation for people who came in **close contact** (i.e., within 6 feet of someone with NERD for at least 15 minutes) with people with a case of NERD is to **self-quarantine** for 14 days from the day that they had the close contact.

The recommendation for people who **have NERD** is to **self-isolate** until 10 days have passed since symptoms first started, at least 24 hours have passed with no fever without fever-reducing medication, and their symptoms are improving.

Part 1: Case investigation



Ishika

My name is **Ishika**. I am an epidemiologist and the team lead for contact tracing at the state health department. Thank you for volunteering to help us with contact tracing for a small cluster of cases in Georgia.

William, our contact tracer, is going to begin the investigation with **Jenn**, a person who has tested positive for NERD infection. She was recently hospitalized with NERD symptoms on July 31. We must determine who Jenn has come in contact with. This will help us inform anyone who may need to isolate or quarantine. It could also help us identify the source of this specific outbreak.

William

Hi **Jenn**, my name is **William** and I am a contact tracer at the state health department. We are calling because we learned that you tested positive for NERD. We were wondering if you could answer a few questions for us:

- Are you sick now, or have you been sick?
- If so, when did your signs and symptoms start?
- Have you recently been in contact with anyone who was sick that you can recall? If so, when?

Jenn

If you are playing the role of Jenn, review your character card to answer each specific question William asked.

Ishika

As a group, we need to identify the following information for **Jenn**.

- Date of onset (start) of symptoms
- Incubation period start date. To determine incubation period, count 14 days before the first start of symptoms.
- Infectious period start date. To determine infectious period, count two days before the start of symptoms.

Be sure to write this information on the character notes and calendar.

William

Jenn, the infectious period for NERD, or the timeframe that you can spread the NERD virus, can start two days before you started showing signs and symptoms. Did you have contact with anyone on or after **[fill in the infectious period start date you calculated above]**?"

Jenn

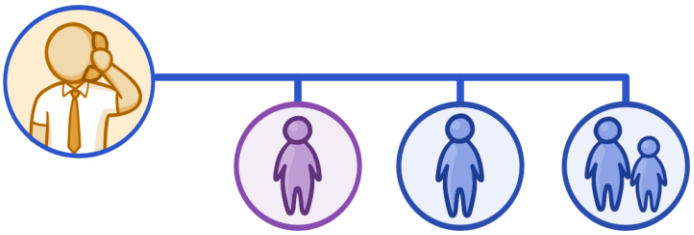
If you are playing the role of Jenn, review your character card to answer William's questions.

Ishika

As a group, we need to make a list of **Jenn's close contacts**, that is anyone she came within 6 feet of for at least 15 minutes during her infectious period. Be sure to write this information on the character notes and calendar.

Let's start with Jenn's immediate family members or people who live in the same house. Taking this into consideration, who should be the first close contact interviewed?

Part 2: Contact Tracing



Ishika

Let's start contact tracing. If you are the contact being interviewed, review your character card to answer the specific questions.

William

[Contact name], my name is **William** and I am from the state health department. We are calling because we learned that you have been recently in close contact with someone who tested positive for NERD. We were wondering if you could answer a few questions for us:

- Are you sick now, or have you been sick?
- If so, when did your signs and symptoms start?
- Have you recently been in contact with anyone who was sick that you can recall? If so, when?

The contact being interviewed answers William's questions.

Ishika

The next step depends on if the close contact has or recently had any NERD symptoms.

If signs and symptoms are present, this person is considered a person with a case of NERD. Calculate the incubation start date, the infectious start date, and when this person can end self-isolation.

If no signs or symptoms are present, this person is considered a close contact. Calculate the date that this contact can end self-quarantine.

William

Because you started showing signs or symptoms of NERD on **[fill in date]**, the recommendation is that you self-isolate until **[fill in date]**, which is 10 days after you started showing symptoms.

Your incubation period likely started on **[fill in the incubation start date]**. With NERD, the infectious period can start two days before you start showing symptoms.

Can you tell us where you went on or after **[fill in the incubation start date]**? Did you have contact with anyone on or after **[fill in the infectious period start date]**?

Although you are not showing signs or symptoms of NERD, the recommendation is that you self-quarantine until **[fill in date]**, which is 14 days after your last contact with a person who has NERD.

Ishika

As a group, we should decide if it is more likely that Jenn got sick from this contact or that this contact got sick from Jenn. We will use our answer to decide who to talk to next. We will continue this process until all contacts are interviewed.

William will continue asking the same questions of each contact. When it is time to interview your character, use your character card to answer William's questions.

Be sure to write this information on the character notes and calendar. After this role play, this information will be used to create your trace map.

Interview Outline (Optional)

Directions: Use the **Case Investigation & Contact Tracing Guide** and this outline to guide you through interviewing the characters in this scenario.

Jenn

Based on Jenn's answers, her son, **Colin**, is a close contact and should be interviewed next.

Colin

Based on Colin's answers, Colin had close contact with **Chayton** and **Deion** who should be interviewed next

Chayton

Based on Chayton's answers, his father, **Kangee**, should be interviewed next.

Kangee

Based on Kangee's answers, his friend **Ralph** should be interviewed next.

Ralph

Ralph's contacts, his wife, and colleagues, are not included in this investigation, but contact tracing could continue with them.

Deion

Based on Deion's answers, Deion had close contact with his household contacts, **LaTanya** and **Denzel**, who should be interviewed next.

LaTanya

LaTanya did not have additional contacts who could be interviewed.

Denzel

Denzel did not have additional contacts who could be interviewed.

Interview Notes

Character notes

Directions: As the investigation plays out, write down important information shared by each character.

Character	Notes
Jenn	
Colin	
Deion	
Denzel	
Chayton	
LaTanya	
Kangee	
Ralph	

Calendar notes

Directions: As the investigation plays out, write down important dates for each character on the calendar.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			July 1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	Aug 1
2	3	4	5	6	7	8

Interview Notes: Answer Key

Character notes

Directions: As the investigation plays out, write down important information shared by each character.

Answer: Answers will vary. Students may include any information from the character cards.

Character	Notes
Jenn	
Colin	
Deion	
Denzel	
Chayton	
LaTanya	
Kangee	
Ralph	

Calendar notes

Directions: As the investigation plays out, write down important dates for each character on the calendar.

Answer: Answers will vary. Students can include date of onset of illness, start and end dates of incubation period, start and end date of infectious period, and dates that characters met. The table below provides important key dates for each character.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			July 1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	Aug 1
2	3	4	5	6	7	8

Character	Onset of symptoms	Date to end self-isolation	Incubation period start date	Infectious period start date	Dates that characters met up
Jenn	July 23	August 2	July 9	July 21	
Colin	July 21	July 31	July 7	July 19	July 10: Soccer
Deion	July 10	July 20	June 26	July 8	July 10: Soccer
Denzel	No symptoms		Not sick	Not sick	
Chayton	July 15	July 25	July 1	July 13	July 10: Soccer
LaTanya	July 5	July 15	June 21	July 3	
Kangee	July 25	August 4	July 11	July 23	July 25: Fishing
Ralph	No symptoms; Tests positive on August 5	August 15	Likely on or before July 22	Likely on or before August 3	July 25: Fishing

Trace Map

Directions: Use the space provided to create a trace map. Use boxes to show character information (e.g., name of character, dates symptoms started). Use arrows to show how characters interacted (e.g., played soccer, lives with, fished with). Then, answer the analysis questions.

Trace map

Discussion questions

1. Who was the first infected person in this scenario?

2. Is your trace map complete? Are there more people that should be interviewed?

3. If today is August 10, who would you recommend to self-quarantine or self-isolate at this time?

4. What could have happened if the contact tracer did not investigate these cases?

5. How did the contact tracing investigation end?

6. Was transmission of the NERD virus primarily through household contacts or outside contacts or a mix of both?

7. How would this contact tracing scenario differ if they were not limiting outside interactions? For example, playing sports, participating in club activities, eating at restaurants, or having small get-togethers.

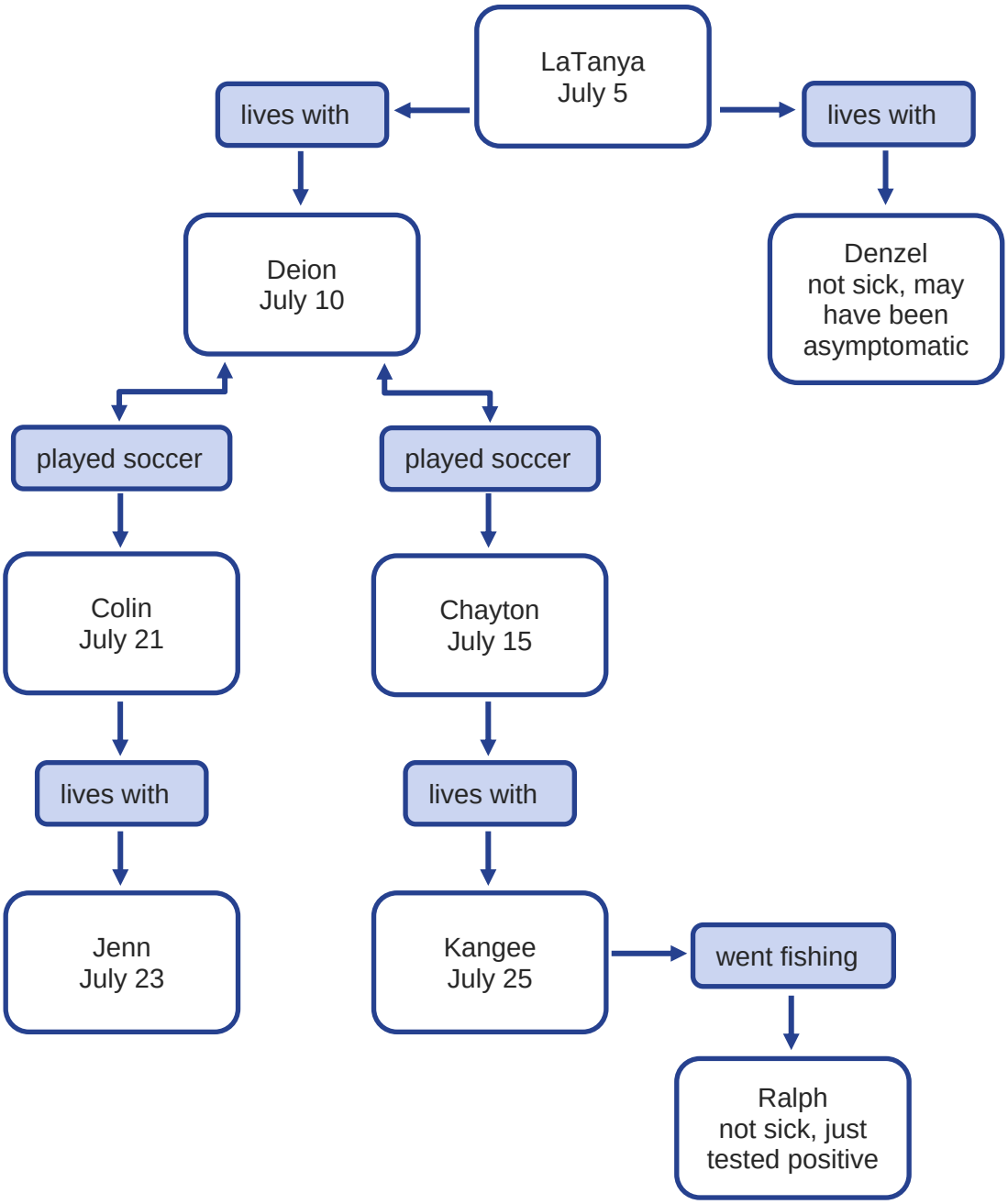
8. How would this contact tracing scenario differ if there were more people living in each house (such as more siblings or grandparents)?

Trace Map: Answer Key

Directions: Use the space provided to create a trace map. Use boxes to show character information (e.g., name of character, dates symptoms started). Use arrows to show how characters interacted (e.g., played soccer, lives with, fished with). Then, answer the analysis questions.

Trace map

Answer: Designs will vary. Map should show LaTanya at the beginning and Ralph at the end. An example is provided below.



Discussion questions

1. Who was the first infected person in this scenario?

   Answer: LaTanya. She started showing NERD symptoms on July 5.

2. Is your trace map complete? Are there more people that should be interviewed?

   Answer: Answers will vary. Pending no additional contacts who show NERD symptoms or test positive for NERD, the trace map would be complete. If a contact of any character has NERD symptoms or tests positive, the contact tracing would continue with additional interviews. Some students might make the argument that contact tracing would continue with Ralph's contacts.

3. If today is August 10, who would you recommend to self-quarantine or self-isolate at this time?

   Answer: The recommendation is that Ralph self-isolate for 10 days after he had a positive test. If today is August 10 and Ralph had a positive test on August 5, he needs to self-isolate through August 15. Ralph's wife and colleagues who he came into contact with during the 14 days before his positive test should self-quarantine. Because it is August 10, all other characters in this investigation have surpassed the self-quarantine or self-isolation periods.

4. What could have happened if the contact tracer did not investigate these cases?

   Answer: If the contact tracer did not investigate these cases, it is likely that the NERD virus would continue to spread from person to person. Contact tracing allows for contacts to be informed of their exposure and advised to self-quarantine to reduce the spread of disease.

5. How did the contact tracing investigation end?

   Answer: The contact tracing investigation in this activity ended after talking with LaTanya, Denzel, and Ralph. LaTanya and Denzel did not have additional contacts who could be interviewed. Ralph has the most recent case of NERD and was advised to self-isolate. Ralph's contacts, his wife, and colleagues, are not included as characters in this case investigation, but contact tracing could continue with them so that they are informed of their exposure, advised to self-quarantine, and monitor themselves for symptoms of NERD. If one of them developed symptoms of NERD, then more contact tracing would be needed.

6. Was transmission of the NERD virus primarily through household contacts or outside contacts or a mix of both?

   Answer: The NERD virus transmission was through a mix of both household contacts (i.e., Jenn and Colin, LaTanya and Deion, Kangee and Chayton) and outside contacts (i.e., Deion and Colin, Deion and Chayton, Kangee and Ralph).

7 How would this contact tracing scenario differ if they were not limiting outside interactions? For example, playing sports, participating in club activities, eating at restaurants, or having small get-togethers.

Answer: Although most characters were limiting their outside interactions, meeting up with friends on a few occasions resulted in NERD transmission among outside contacts, which might have resulted in NERD transmission among household members. If they were not limiting outside interactions, more transmission might have occurred.

8 How would this contact tracing scenario differ if there were more people living in each house (such as more siblings or grandparents)?

Answer: If more people were living in each house, more outside contacts and more sick household members might have been involved. If those household members were at high risk for more severe disease (e.g., older adults like grandparents), more hospitalizations and deaths might have occurred.