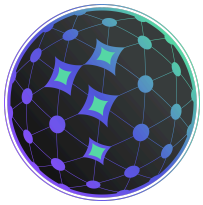


Activity: Doctor, Doctor!

Pre-Class Reading(s)	Pre-Class Crash Course Video	Associated Lesson	Relevant Standards (NGSS)
Chapter 3: Clinical Symptomatology, Introduction & 3.1; and Chapter 7: Diagnostic Tests, Introduction & 7.1	Episode #6: How Do We Know We're Sick?	Doctor, Doctor! (Clinical Symptomatology and Diagnostics)	• HS-ETS1-3 • HS-LS2-8

Introduction

In medicine, **clinical symptomatology** focuses on understanding and interpreting the symptoms of diseases. Derived from the Greek word *symptoma*, meaning "a happening or occurrence," symptomatology involves the detailed observation, recording, and analysis of symptoms to diagnose and manage diseases. Symptoms, the subjective experiences reported by patients, such as pain, fatigue, or nausea, serve as vital diagnostic clues. With infectious diseases, recognizing patterns of symptoms allows healthcare professionals to narrow down potential causes and initiate appropriate treatments. By accurately interpreting symptoms, healthcare providers can identify the underlying causes of illnesses and tailor treatment plans to address both the symptoms and the root cause of the disease.

A hands-on game, "Doctor, Doctor!" is designed to familiarize students with the concepts of clinical symptomatology and the role of diagnostics as they experience being a physician or a patient describing the symptoms they are presenting for a specific infectious disease.

Learning Objectives

By the end of this activity, students will:

- Understand how a patient's symptoms, medical history, and other relevant information can direct a physician toward a specific pathogen and diagnosis
- Appreciate the importance of diagnostic tests and how they fit into the healthcare system during an outbreak

- Understand the cyclical nature of diagnosis to diagnostic confirmation based on clinical symptomatology and testing
- Recognize the challenges associated with limited resources in a clinical setting

Materials Needed (see Printables)

- One secret "Patient List" for teacher
- One set per patient: "Patient Symptoms"
- One set per doctor: "Patient Record"
- One set per lab technician: "Patient Test"
- Pens/pencils

Purpose of the Activity

"Doctor, Doctor!" is an interactive activity where players analyze patient symptoms to identify the pathogen responsible for the illness. After making their guesses, the players pass their findings to a "lab" group, which conducts diagnostic tests to confirm the accuracy of the guesses. This activity leads to a subsequent activity focused on therapeutics and treatment, building a comprehensive understanding of disease diagnosis and management.

- **Target age group:** 10 and up
- **Time to play:** 15-30 min (or for as long as you want)
- **Materials:** Printables (scroll down)
- **Number of players:** Full class

How to Get Started

1. Provide students with the symptom chart below
2. Section the classroom into three group areas
    a. Patient waiting room
    b. Treatment rooms (one per doctor)
    c. Diagnostics lab
3. Break the class into three groups:
    a. Patients (10-12)
    b. Doctors (3-4)
    c. Lab Technicians (3-4)

How to Play

The **teacher** will:

- Provide a symptoms chart to each student.
- Record each patient's name and assigned pathogen.
- Provide each patient a slip of paper (see below) that lists their symptoms to use during their doctor's appointment.
- When asked by the lab technician, confirm whether the test is positive (the assigned pathogen matches the guess) or negative (the pathogen assigned does NOT match the pathogen guessed).
- Write a list of incorrect diagnoses on the board for later discussion about challenges in clinical symptomatology and lessons learned.

The **patient** will:

- Approach the teacher to pick up their single "Patient Symptoms" slip that has been assigned by the teacher.
- Take a seat in the waiting room and wait for the doctor to call the patient into the office.
- Answer only Yes or No to the doctor's questions.

The **doctor** will:

- Ask only **THREE Yes/No questions** about the patient's symptoms to make a diagnosis. (They are not allowed to see the slip of paper listing patient symptoms.)
- Once a determination is made, the doctor will send the patient to the Lab for testing to confirm or deny the doctor's diagnosis.

The **lab technician** will:

- Record the name of the patient
- Record the pathogen being tested for
- Notify the teacher, who will confirm or deny the diagnosis.
- Record if the test is positive or negative
    - If positive, send the patient back to their seat
    - If negative, send the patient back to the waiting room
- Keep track of how many tests are left for each pathogen

Symptoms Chart (All)

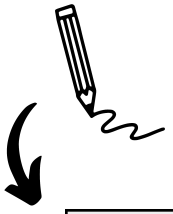
♠ = Viruses (6) ♦ = Bacteria (3) ♥ = Protozoa (2) ♣ = Fungi (2)

Type	Pathogen	Disease	Symptoms
♠	Ebola virus (EBOV)	Ebola virus disease (EVD)	fever, headache, joint and muscle aches, weakness and fatigue, sore throat, gastrointestinal symptoms including abdominal (belly) pain, diarrhea, vomiting, loss of appetite, unexplained bleeding or bruising
♠	Human immunodeficiency virus (HIV)	Acquired Immunodeficiency Syndrome (AIDS)	fever, fatigue, swollen lymph glands, diarrhea, weight loss, oral yeast infection (aka thrush), shingles (herpes zoster), pneumonia
♠	Influenza A virus (FLU A)	Flu	fever/feeling feverish or chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, fatigue (tiredness)
♠	Zika virus (ZIKV)	Zika virus disease	fever, rash, headache, joint and muscle pain, red eyes, and microcephaly in babies
♠	Severe acute respiratory syndrome coronavirus 2019 (SARS-CoV-2)	COVID-19	fever, chills, cough, shortness of breath, fatigue, muscle aches, headache, loss of taste or smell, sore throat, nasal congestion or rhinorrhea, vomiting or diarrhea, or skin rashes
♠	Measles virus (MV)	Measles	cough, runny nose, inflamed eyes, sore throat, fever, and a red, blotchy skin rash (Koplik's spots)
♦	*Staphylococcus aureus*	Staph skin infection	blister, boil, impetigo, rashes, or redness, chills or fever, abscess, pus, or swelling
♦	*Mycobacterium tuberculosis*	Tuberculosis	chronic cough, chest pain, coughing up blood, chills, fatigue, fever, loss of appetite, shortness of breath, swollen lymph nodes, severe weight loss
♦	*Vibrio cholerae*	Cholera	profuse watery diarrhea, sometimes described as "rice-water stools," vomiting, thirst, leg cramps, restlessness, or irritability
♥	*Trypanosoma brucei*	Sleeping sickness	painful bite that can develop into a red sore, fever, severe headaches, irritability, extreme fatigue, swollen lymph nodes, aching muscles and joints, skin rash
♥	*Plasmodium falciparum*	Malaria	fever, chills, sweats, headaches, nausea and vomiting, body aches, jaundice, severe anemia, low blood pressure (hypotension)
♣	*Candida*	Oral thrush	creamy white patches in the mouth or throat, redness or soreness, cotton-like feeling, loss of taste, pain while eating or swallowing, cracking and redness at the corners of the mouth
♣	*Aspergillus*	Aspergillosis	coughing up blood or brownish mucus plugs, fever, wheezing, shortness of breath, chest pain, headaches

Patient List (Teacher)

After assigning patients to a pathogen, cut out the Symptoms section and hand it to them.

Patient	Pathogen	Symptoms
	Ebola virus (EBOV)	fever, headache, joint and muscle aches, weakness and fatigue, sore throat, gastrointestinal symptoms including abdominal (belly) pain, diarrhea, vomiting, loss of appetite, unexplained bleeding or bruising
	Human immunodeficiency virus (HIV)	fever, fatigue, swollen lymph glands, diarrhea, weight loss, oral yeast infection (aka thrush), shingles (herpes zoster), pneumonia
	Influenza A virus (FLU A)	fever/feeling feverish or chills, cough, sore throat, runny or stuffy nose, muscle or body aches, headaches, fatigue (tiredness)
	Zika virus (ZIKV)	fever, rash, headache, joint and muscle pain, red eyes, and microcephaly in babies
	Severe acute respiratory syndrome coronavirus 2019 (SARS-CoV-2)	fever, chills, cough, shortness of breath, fatigue, muscle aches, headache, loss of taste or smell, sore throat, nasal congestion or rhinorrhea, vomiting or diarrhea, or skin rashes
	Measles virus (MV)	cough, runny nose, inflamed eyes, sore throat, fever, and a red, blotchy skin rash (Koplik's spots)
	Staphylococcus aureus	blister, boil, impetigo, rashes, or redness, chills or fever, abscess, pus, or swelling
	Mycobacterium tuberculosis	chronic cough, chest pain, coughing up blood, chills, fatigue, fever, loss of appetite, shortness of breath, swollen lymph nodes, severe weight loss
	Vibrio cholerae	profuse watery diarrhea, sometimes described as "rice-water stools," vomiting, thirst, leg cramps, restlessness, or irritability
	Trypanosoma brucei	painful bite that can develop into a red sore, fever, severe headaches, irritability, extreme fatigue, swollen lymph nodes, aching muscles and joints, skin rash
	Plasmodium falciparum	fever, chills, sweats, headaches, nausea and vomiting, body aches, jaundice, severe anemia, low blood pressure (hypotension)
	Candida	creamy white patches in the mouth or throat, redness or soreness, cotton-like feeling, loss of taste, pain while eating or swallowing, cracking and redness at the corners of the mouth
	Aspergillus	coughing up blood or brownish mucus plugs, fever, wheezing, shortness of breath, chest pain, headaches



Patient Record (Doctor)

3 Yes/No questions allowed per patient diagnosis

Patient	Symptoms	Diagnosis

Diagnostic Lab Tests (Lab Technician)

2 tests each: Viruses (6), Bacteria (3), Protozoa (2), Fungi (2)

Patient	Pathogen	Positive/Negative	Tests Available
	Ebola virus (EBOV)		
	Human immunodeficiency virus (HIV)		
	Influenza A virus (FLU A)		
	Zika virus (ZIKV)		
	Severe acute respiratory syndrome coronavirus 2019 (SARS-CoV-2)		
	Measles virus (MV)		
	Staphylococcus aureus		
	Mycobacterium tuberculosis		
	Vibrio cholerae		
	Trypanosoma brucei		
	Plasmodium falciparum		
	Candida		
	Aspergillus