**A Shot in the Arm**

**Case Analysis Introducing Key Concepts about the Immune System and HIV/AIDS**

Read this Scene: Two young adults discuss the prevalence of HIV/AIDS and the lack of a vaccine.

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Michael was waiting impatiently in the doctor’s office. It was flu season, again, and he was there to get his flu shot. Bored, and walking around the waiting room, he saw medical pamphlets and started reading them out loud to his girlfriend, Natalie.

“Get this. ‘Of the 50,000 new cases of HIV each year in the United States, 26% of them are in young people, aged 13 to 24.‘ You know, they should just develop a vaccine. AIDS has been around forever—they should be able to do something.”

“I know,” replied Natalie. “In fact, they had stuff on the news about people who are immune. Some guy they called the Berlin patient was cured of AIDS when he got a bone marrow transplant and a baby who was cured. Except that I did hear that the baby wasn’t really cured and she still has HIV.”

Michael kept reading the pamphlet out loud. “Treatments typically consist of what doctors term a ‘cocktail,’ which is a combination of antiretroviral medications.”

Natalie interjected, “Oh, you know, I think they said something about that baby being on some combination of medicines. Maybe it was that cocktail thing you said. I don’t know about the other guy, though, that Berlin patient. I think he got some kind of immunity from the stem cell transplant.”

“Yeah—immunity, kind of like the vaccine I will be getting if they ever call my name. HIV is a virus and the flu is caused by a virus, right?”

“The V in HIV stands for virus, so yes. I am honestly not sure about the flu. I think it is a virus. Does it say anything in there about AIDS virus, like why there isn’t a vaccine?”

“Let me look. It says that the virus is spread by body fluids and that it attacks CD4 cells or T cells. This disables the immune system so that the patient is subject to frequent infections and disease. I still don’t see anything about a vaccine.”

Natalie looked puzzled and then suddenly remembered something. “I get the part about the diseases. I think they found AIDS when all of these people were showing symptoms of rare diseases.”

“Yeah, well, at this rate, I will get the flu before the vaccine. I hope they call me soon.”

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**Case Analysis Sheet**

1. ***Recognize potential issues and major topics in this case.*** What is the case about?

Highlight terms or phrases that seem to be important to understanding the case.

2. ***What specific questions do you have about these topics?*** Fill in the table below. To do this, first, by yourself, then with the people at your table, make a list of what you already know that is related to the case in the *What Do I Know* column. List questions you would like to learn more about in *What Do I Need to Know*? Column.

|  |  |
| --- | --- |
| ***What Do I Know*** | ***What Do I Need to Know?*** |
|  |  |

3. Put a check mark by 1-3 questions or issues in the *What Do I Need to Know?* Column that you think are the most important to explore.

Modified from M. Waterman and E. Stanley, 2008, *Biological Inquiry,* Benjamin Cummings

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Once you have decided on your question, use the following chart to help you organize your argument. You will be presenting your research and findings to the class in a poster.

**Claim-Evidence-Reasoning**

|  |
| --- |
| **Questions asked** |
|  |
| **Observations** *(phenomena, data, measurements)* | **Inferences** (*generalization, patterns, laws, data displays, model-based predictions)* | **Scientific Explanations** *(hypotheses, models, theories)* |
|  |  |  |
| **Claim** *(Your claim should answer the question)* |
|  |
| **Explanation** *(Link the observations, inferences and scientific explanation to support your claim.)* |
|  |
| **Limitations and error analysis** *(What additional evidence would you need to make your claim stronger?)* |
|  |

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