

Safe Water?

Part 1: Case of an Ailing Infant

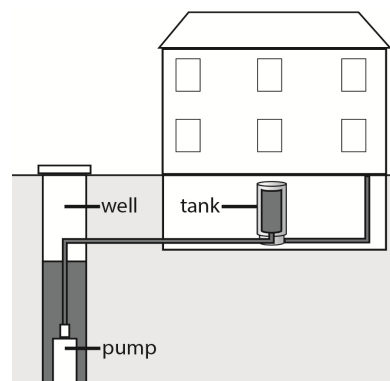
Patient: Joey Nash

Age: 5 months

Symptoms: Vomiting, diarrhea, bluish skin, weakness, and increased breathing rate

Patient History: Joey's parents report that he was healthy until they moved several weeks ago into a home near a small farm. The water that the Nash family uses for drinking, cooking, and for preparing Joey's baby formula comes from their private well, not the town's public water supply.

Recommendation: Well water testing should be done because several families who live near the Nash family have had health problems due to contaminated well water.



You will test the water from the Nash's well for three potential contaminants that could be causing Joey's symptoms—coliform bacteria, nitrates, and arsenic.

1. Place one drop of the well water sample into each of the circles on the **Well Water Testing** sheet.
2. Add one drop of each of the appropriate test solutions to the Well Water Testing circles:
 - a. Add one drop of Coliform Bacteria Test Solution to the Coliform Bacteria Test circle.
 - b. Add one drop of Nitrate Test Solution to the Nitrate Test circle.
 - c. Add one drop of Arsenic Test Solution to the Arsenic Test circle.

3. Use the **Water Testing Color Charts** in your kit to determine whether the concentration of each contaminant is safe or unsafe (too high). Record the results of the water tests in the data table below.

Potential Well Water Contaminant	Safe or Unsafe
Coliform Bacteria	
Nitrates	
Arsenic	

4. Based on the results of the well water tests, what conclusions can you draw about the safety of the water in the Nash's well?

Base your answers to questions 5 through 9 on the information in the **Fact Sheet: Well Water Safety**.

5. Which of Joey's symptoms may be caused by unsafe nitrate levels in the well water?

6. Name the condition caused by unsafe nitrate levels and the treatment used for this condition.

7. Which of Joey's symptoms may be caused by unsafe coliform bacteria levels in the well water?

8. Name the condition caused by unsafe coliform levels and the treatment used for this condition.

9. List at least three likely sources of the contaminants that made Joey sick? Be specific.

- ---
- ---
- ---

10. List at least three actions that Joey's family could take to prevent well water contamination from affecting their health in the future.

- ---
- ---
- ---

Part 2: Tap Water versus Bottled Water

Joey recovered from his illnesses, and for a while the Nash family used bottled water for all of their drinking and cooking. However, bottled water was expensive and their landlord refused to take action to treat their water supply. The Nash family moved to an apartment in town so that they would have tap water from the town's public water supply. The town water supply came from a local lake and was treated and tested before it was distributed to the town.

Town officials gave Mrs. Nash a copy of an official report that said the water had been tested and was safe. To be sure the town's water was safe, Mrs. Nash sent a sample of the town tap water to a state certified water testing laboratory. For comparison, she also sent a sample of "Pure Spring Water" sold by a local bottled water company.

You will test samples of the bottled water and the town tap water for three potential contaminants—coliform bacteria, nitrates, and arsenic.

1. Place one drop of the bottled water sample into each of the Bottled Water Testing circles on the **Bottled Water Testing** sheet.
2. Place one drop of the tap water sample into each of the Tap Water Testing circles on the **Tap Water Testing** sheet.
3. Add one drop of each of the appropriate test solutions to the Bottled Water Testing circles and the Tap Water Testing circles:
 - a. Add one drop of Coliform Bacteria Test Solution to the Coliform Bacteria Test circles.
 - b. Add one drop of Nitrate Test Solution to the Nitrate Test circles.
 - c. Add one drop of Arsenic Test Solution to the Arsenic Test circles.

4. Use the **Water Testing Color Charts** in your kit to determine whether the concentration of each contaminant is safe or unsafe (too high). Record the results of the water tests in the data table below.

Potential Water Contaminant	Bottled Water Safe or Unsafe	Tap Water Safe or Unsafe
Coliform Bacteria		
Nitrates		
Arsenic		

5. Based on the results of the bottled water and tap water tests, what conclusions can you draw about the safety of each type of water?

6. Mrs. Nash would like to continue using bottled water for drinking and cooking. List one possible reason why she might prefer to use bottled water instead of tap water.

7. Mr. Nash would prefer using tap water for drinking and cooking. List one possible reason why he might prefer to use tap water instead of bottled water.
