

Case Study: Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Teacher Resource

Curricular Links: SBI3U

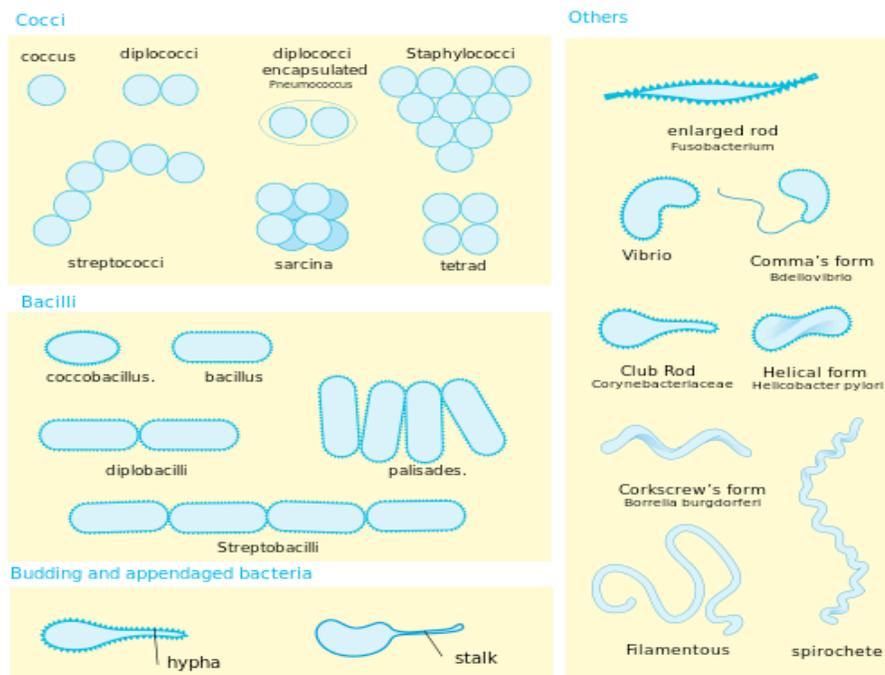
Time: 45 minutes class period

Suggested Answers

1. Based on the scenario listed above, what would be your diagnosis? If you were a health care provider, what course of action would you plan to be certain.

The symptoms of redness, swelling, pain, heat and the presence of pus lead to a visual diagnosis of MRSA. Take a swab or sample from the infected wound, or other site of infection, for laboratory testing. Advise the patient to cover the infected area with a bandage to avoid further spreading.

2. The three main shapes of bacteria are spherical, rod-shaped, and spiral. Examine the chart shown below. Shown in this chart are different groupings of bacterial cells. Next to the drawing of the bacterial cells are the names used to describe the groupings.



Last update: April, 2020

- A. Bacteria are usually named for their shape and appearance. Below are listed several scientific names of bacteria. Next to each name, draw what you think the bacteria will look like.

Staphylococcus aureus
cluster of spherical bacteria

Diplococcus pneumonia
spherical bacteria in pairs

Streptobacillus nicolau
rod-shaped bacteria in chains

Spirillum minus (single cell)
spiral bacteria

- B. Other bacteria are named for part of the body they infect or the disease they cause. Look at the scientific names given in the chart below. Determine what disease or body part each bacterium affects.

Scientific name of bacterium	Disease or body part affected
<i>Diplococcus pneumonia</i>	pneumonia (lungs)
<i>Neisseria meningitides</i>	spinal meningitis
<i>Clostridium tetani</i>	tetanus (lock jaw)
<i>Escherichia coli</i>	large intestine (colon)
<i>Bordetella bronchiseptica</i>	bronchitis
<i>Staphylococcus epidermidis</i>	skin infections
<i>Mycobacterium tuberculosis</i>	tuberculosis (lungs)

3. Based on the ability of certain bacteria to survive on common hospital surfaces, what control mechanisms would you introduce to control the spread of bacteria?

These results show the need for thorough contact control and careful disinfection procedures to limit spread of bacteria

4. Four isolates of *Staphylococcus aureus* are being tested below with an antibiotic oxacillin. From the lab results, what can you conclude?

The MRSA resistance to oxacillin being tested, the far left *s. aureus* isolate is sensitive to oxacillin, the other three isolates are MRSA positive, and will require a different antibiotic to eliminate the bacteria.

5. Using appropriate sources research, research how scientist and health care providers are discovering new treatments for MRSA and other resistant bacteria.

The following new releases can prove helpful to students:

- One and Done: New Antibiotic Could Provide Single-Dose Option:
<http://www.newswise.com/articles/one-and-done-new-antibiotic-could-provide-single-dose-option?>
- Anthrax and MRSA antibiotic found in ocean:
<http://www.medicalnewstoday.com/articles/263621.php>
- Could tapeworm drug be used to treat MRSA?
<http://www.medicalnewstoday.com/articles/292996.php>

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