

What's Wrong with Maria? Part 1

Read the following medical case. Use the internet to research any and all information that is not clear to you. Then start to diagnose the patient.

ADMISSIONS INFORMATION:

On July 13th, 2014, Maria Espinoza, a 22-year-old college student, came into the emergency room complaining of fever, malaise, headaches, and myalgia.

PRESENTING COMPLAINTS:

Ms. Espinoza states that she has been feeling unwell for about two months. She complains of malaise and loss of appetite, and she has lost 25 pounds in two months. When asked, she affirms that she has been having intermittent episodes of low-grade fever in the afternoons, but they would be gone by the next morning. She decided to come in today, because in addition to her fever and malaise, she started to develop joint pains in multiple areas, and she is worried that the condition is getting worse rather than better. She has been taking Tylenol for the fever, headache and myalgia. The patient negates the use of any other medications, except for occasional use of Midol for menstrual cramps. Patient denies shortness of breath, abdominal pains, and digestive difficulties except for loss of appetite. She states that she has not tried to lose weight and has not changed her dietary habits. She has not traveled or had contact with animals over the past three months. The patient affirms that she is sexually active, having had the same sexual partner over the last 6 months.

PAST MEDICAL HISTORY:

Ms. Espinoza was born prematurely and had to stay incubated for three weeks. She developed pneumonia and a mitral valve prolapse. At age 7, she had a fracture of her right greater tuberosity of the humerus, and at age 12 she had an appendectomy. Her dentist performed a root canal 9 weeks ago.

FAMILY HISTORY:

Unremarkable

MEDICAL EXAM:

Height: 5'5"

Weight: 110 lbs.

Temperature 101.30°F

Blood Pressure 120/80 (normal)

Pulse 90 beats per minute (elevated), heart murmur over mitral valve.

Abdominal, respiratory, neurological, musculoskeletal, urological examinations are unremarkable.

LAB REPORT:

Elevated neutrophils, C-reactive protein elevated, normal T cell count.

Lab culture shows presence of *Streptococcus viridans*.

Echocardiography visualizes vegetation on the mitral valve.

1. Diagnose Maria's problem. For each section, look up the terms you do not understand and then explain each section in your own words.

Admissions Information:

Presenting Complaints:

Past Medical History:

Family History:

Medical Exam:

Lab Report:

2. Determine which information is helpful, and which is not.

Important Information:	Extraneous Information:
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3. Now research 3 diseases that this could be. Justify using the medical information provided.

A. Disease: _____ Justification:
B. Disease: _____ Justification:
C. Disease: _____ Justification:

4. Which of the 3 diseases do you think is most likely the one Maria has? _____

What's Wrong with Maria? Part 2

Maria is diagnosed with endocarditis.

1. What are biofilms?

2. What is endocarditis and what does endocarditis have to do with biofilms?

3. Do some research on the treatment of endocarditis and take notes below.

4. Based on the information provided in part one, how did Maria get endocarditis? Note: her symptoms just came about within the past two months!

What's Wrong with Maria? Part 3

Maria's mother wants to sue her dentist for malpractice, believing that it is his fault for her getting endocarditis. Help her mother determine whether or not she has a valid case.

Go to www.surgerysquad.com. Click on "Root Canal." Watch the tutorial.

1. Summarize the procedure of a root canal.
2. At which step during the root canal is it most likely that the bacteria got into the bloodstream?
3. Do you support Maria's mother claim that Maria's dentist is to blame and thus should be sued for malpractice? Explain your stance.

What's Wrong with Maria? Part 4

A biofilm is composed of bacteria and other microorganisms that are embedded in a self-produced matrix of extracellular polymeric substance (EPS). This gives biofilms a slimy feeling. Biofilms are made out of extracellular DNA, proteins and polysaccharides. Due to the structure and the different genetic expression, bacteria growing in a biofilm are highly resistant to antimicrobial agents, up to 1,000 times more resistant than the same bacteria not growing in a biofilm.

Bacteria and bacteria biofilms are very prevalent in the mouth. In fact, dental plaque is a sticky, colorless film of bacteria that forms on the teeth. These bacteria metabolize carbohydrates producing acid as a result. If the frequency of carbohydrate intake increases, then bacteria in the plaque will produce acid; this dissolves the enamel, leading to tooth decay, known as dental caries. The plaque can also form at and under the gingiva (gum), which then can lead to tooth root decay and breakdown of the bone supporting the tooth. Furthermore, mineral deposits can harden plaque, causing tartar, which can only be removed through professional dental cleaning. Not only will tartar contribute to tooth and gum decay, but it makes it difficult to clean in between teeth (leading to more decay), and it often leads to gingivitis (gum tissue inflammation), which can lead to even more oral disease.

Current guidelines to maintain dental health include brushing teeth, flossing and using mouthwash. While brushing teeth is effective in removing plaque, it does not reach all the surfaces and, therefore, flossing is important to eradicate the plaque in these places. Mouthwashes are recommended since there is strong evidence that they are good anti-plaque, anti-gingivitis agents.

In this lab, you will test a popular mouthwash to determine its effectiveness in killing bacteria and destroying bacterial biofilms. Your goal is to determine whether or not the mouthwash is an effective preventative treatment against bacterial infections that start in the mouth and could enter the bloodstream to infect other body parts.

PROCEDURE:

(take notes here, as you will be expected to recite the procedure back to us on your poster/report)