**Body Invasion – How meningococcal bacteria affects the body.**  
(Courtesy of the Meningitis Trust, UK)

1. You are now going to experience a body invasion. As you read through this section, you will see how the body is affected when invaded by meningococcal bacteria.

2. Meningococcal bacteria enter the body through the nose and mouth.

3. The nose is the first part of the respiratory system through which incoming air passes, and is warmed, moistened and filtered. The nose is lined with a ciliated mucous membrane, which trap particles of dust and other impurities such as microorganisms to prevent them entering the lungs.

4. The meningococcal bacteria can be carried at the back of the nose and throat for weeks or months without causing illness.

**Successful Invasion**

5. When the meningococcal bacteria invade, they release a chemical, which destroys the cilia at the back of the nose. This allows the bacteria to then cross the mucous membrane and enter the bloodstream.

**Bacteria Enter the Bloodstream**

6. When the meningococcal bacteria enter the bloodstream, they begin to multiply rapidly, double in number every 20-30 minutes.

The slimy outer coating of the bacteria will release endotoxins (poisons) and the body’s immune system will start to fight the infection. White blood cells will begin to engulf the bacteria, but this is not enough. This response by the immune system will cause general signs of becoming unwell – high temperature, drowsiness, and vomiting.

The bacteria travel in the bloodstream and may cause inflammation of the meninges (meningitis) or poison the blood (septicemia). Most commonly, the bacteria will cause meningitis and septicemia.

**Meningitis**

7. When the meningococcal bacteria travel in the bloodstream to infect the meninges, the blood vessels in the linings of the brain are damaged. This allows the bacteria to break through and infect the cerebrospinal fluid (CSF). The meninges become inflamed and pressure around the brain can cause nerve damage.
**Meningitis Specific Symptoms**

8. When the meninges become inflamed, the pressure on the nerves produces more specific symptoms associated with meningitis. Severe headache, dislike of bright light, neck stiffness, and confusion.

**Septicemia**

9. As the bacteria are multiplying rapidly in the bloodstream, they begin to release endotoxins from their slimy outer coating. These endotoxins are released into the bloodstream as greasy bubbles.

White blood cells (phagocytes) will start to engulf and kill the bacteria, but will not have an affect on the endotoxins.

The endotoxins cause the white blood cells to release a chemical, which makes the walls of blood vessels sticky. The white blood cells then stick to the walls and cause damage to the blood vessels.

10. Treatment with antibiotics will instantly kill bacteria, but has no effect on the endotoxins. When the bacteria die, they will release even more endotoxins. This is why a septicemic rash may be seen to worsen after treatment has begun.

During this process proteins contained in the blood that prevent clotting have been destroyed. Platelets in the blood will begin to clot to try and repair the damage to the blood vessels. They will also stick to the white blood cells, and the blood vessels will eventually become blocked.

**Septicemia Specific Symptoms**

11. When blood vessels become blocked, the surrounding tissues die. The damaged vessels disintegrate, allowing blood and other fluids to leak out. The visible rash associated with septicemia is caused by blood leaking under the skin.

Internally, blood vessels will be affected throughout the body, causing damage to the major organs and slowing the heart rate. This will result in the more specific signs of septicemia, fever with cold hands and feet and shock.

**Meningitis and Septicemia**

12. Most commonly meningitis and septicemia occur together, causing the complicated processes you have just seen. Meningitis and septicemia (meningococcal disease) will involve and can damage all of the organs of the body.

Therefore, this disease often has devastating affects and can result in death.