Welcome to this lesson on innate immunity. Today we will be describing innate immunity as the body's second line of defense against pathogens. So as I mentioned, innate immunity is the body's second line of defense, after physical barriers. So physical barriers are the body's first line of defense that help to keep pathogens out of the body. But once they've entered the body, innate immunity will kick in as a second line of defense and will try to get rid of those pathogens before they can cause any sort of infection.

So innate immunity involves very general responses. And so what I mean by this is that the cells that are working in innate immunity are not specialized. So the cells in innate immunity will attack any type of pathogen, regardless of what it is. They're not going to be identifying it and seeking out specific type of pathogens. These cells are just going to basically attack anything that they can find and try and wipe it out.

So innate immunity is carried out by white blood cells and proteins and is very nonspecific. It's kind of a cure-all type of immunity where the cells are just trying to get rid of whatever they can. So innate immunity includes processes like phagocytosis, fever, and inflammation. And we'll talk about those in just a moment here.

So usually when a pathogen enters the body, if it's gotten past the physical barriers, macrophages will be the first on the scene. And they will engulf those foreign cells. And the complement system is a very important part of innate immunity. The complement system.

So what this is is it's a set of proteins in the body that will roam around unactive. But once they encounter a pathogen, they will become active. And by becoming active, they trigger additional complement proteins. And they also trigger certain processes.

So what will happen once the complement system has been activated is that more phagocytic white blood cells will be on the scene in order to engulf whatever the invader is. The complement system, once those cells or once those proteins are activated, will also trigger inflammation. So mast cells and basophils will release something called histamine. So they release something called histamine.

And histamine causes the arterials to dilate. So the arterials are a type of blood vessel within our body. So it will cause them to dilate or to expand.

And what this does is it allows more blood to flow through them. And as more blood is flowing through them, it's going to cause the tissue to become red and warm. So that's what inflammation is. So at the same time, capillaries are also leaking out plasma proteins and phagocytes that will act as a line of defense as well.

And something else that will happen is that a fever will be produced. So these complement system proteins when

they're activated will also help to produce a fever. So a fever happens when macrophages release substances which then trigger the brain to release signal molecules to raise the body's set temperature.

So normally our set temperature is around 98.6 degrees. And that's set by the hypothalamus. But when it's signaled that the body temperature needs to be raised, then the body temperature will raise. And by doing so, it will inhibit these pathogens so they can't function as well.

So generally a fever of around 100 degrees Fahrenheit is ideal. So at this temperature, 100 degrees Fahrenheit, those pathogens won't be able to function as well. But it's also not causing any tissue damage.

If temperatures get too high, if a person's fever gets too high, what happens is that it can damage tissue. It causes enzymes in our body not to function properly. It can even lead to death if the temperature gets too high. So a temperature of around 100 degrees Fahrenheit is ideal for killing pathogens.

So phagocytosis, as I mentioned, inflammation, and fever will generally be able to rid the body of most types of pathogens. So these are all features of innate immunity, kind of generalized, nonspecific defenses in order to try and get rid of these pathogens.

So most of the time, this will do the trick. However, sometimes pathogens will persist. And this will not be enough, in which case, adaptive immunity will then need to take over. And adaptive immunity has different processes in order to help get rid of these type of pathogens that are persisting.

So this lesson has been an overview on innate immunity.