

The Immune System and Vaccines (Part 1)

I get many questions regarding why we vaccinate pets against certain diseases, how we determine how frequently vaccines are needed, and the safety of vaccines. The first part of addressing these questions is understanding how the immune system works in regard to disease and vaccines.

Every animal's body comes in contact daily with bacteria, viruses, and other organisms that have the potential to cause disease or illness just like a country faces outside influences that threaten the safety of the nation. Our country maintains an army to protect us from these threats; the immune system is like an army for the body. It is there when an emergency response is needed in the face of a threat, but it requires training in order to know how to respond to that emergency. Just as soldiers train for years in order to respond to threats they may encounter, we help train our pets' immune systems to respond to the infectious organisms they may encounter throughout their life.

The two main components of the immune system that respond to infectious organisms are antibodies and memory cells. Antibodies are made to respond to a specific threat and they circulate in the blood always on the lookout for that specific threat; these are the soldiers of the army. When a threat such as a virus or bacteria enters the body, the antibodies that have been trained for that specific organism are there to neutralize the attack before it can cause disease.

Memory cells are the factories within the body that produce antibodies; these are the drill sergeants who train the soldiers. Once a memory cell has been made, it remains in the body for the life of the individual. It can then respond within hours of infection to produce more antibodies to fight off that specific organism. So how does the immune system know which memory cells and antibodies to produce?

Each time the body is exposed to an organism (virus or bacteria), through natural exposure (infection) or vaccination, the immune system makes memory cells which then produce antibodies to that organism. With puppies and kittens, we put their immune system through basic training with the series of vaccinations between 8-16 weeks of age. By vaccinating in a series, we are producing memory cells and creating antibodies for the organisms that are the biggest threat to animal and human health.

An army requires a regular training schedule to keep their skills in tip top shape, and the immune systems of our pets do as well. This is why we continue to vaccinate throughout the life of an animal. The goal is to make sure each animal will have the ability to respond to a threat and neutralize the infectious organism before the organism can cause illness or death. Different vaccines have different results in the body, so some are required more often than others. Each animal may respond differently to a vaccine. For this reason, we base our vaccine protocols on the average response of the whole population. We also recognize that each animal may have a different lifestyle which requires us to tailor vaccine choices to that individual.

The overall goal of vaccination is to make sure that each individual is protected to the best of our ability. We do this by training the immune system to fight the most harmful organisms. In my

next blog, we will discuss vaccinations, safety, and our recommendations at Alaska Veterinary Clinic in more depth.

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