Diving into the inner-workings of the immune system

- Do children get too many vaccines?
- Is a child's immune system developed enough at birth to get the hepatitis B vaccine?
- Does my child still need vaccines if I am breastfeeding?
- How many vaccines can a child handle at one time?
- Why are multiple doses of some vaccines needed?

At their heart, these questions all hinge on understanding how the immune system works. But, many parents never had much in the way of formal education related to the immune system and how it works. In addition, scientists continue to learn more about the intricate interactions of the immune system that are just as important, and ever-present, as those that control the beating of our hearts and the breaths we take.

On-call 24/7

The immune system works from the moment we are born. It has to. In the womb, babies are in a sterile environment, but the birth canal is not sterile, nor is the incubator in which the newborn is placed — or the air in the delivery room for that matter. If our immune systems were not ready to leap into action as soon as we were born, humanity would not survive.

While some aspects of the immune system get better at their “jobs” over time, for the most part, the immune system has the tools necessary to protect us from the moment of birth.

Trillions of bacteria

As mentioned, the environment is not sterile, and that is good for a couple of reasons. First, some bacteria live on our skin and in our digestive tract and help to keep us healthy, mainly by contributing to an environment that is less friendly for potential disease-causing agents and by “filling up space,” so that pathogens can’t gain access to our cells.

Shortly after birth, bacteria can be found lining the nose, throat and intestines of all newborns. These bacteria provide a variety of functions, including helping to digest food and make vitamin K. In fact, bacteria have been detected in low levels in breast milk, suggesting that it is important that mothers transfer these bacteria to their babies’ intestinal tracts.

By the time we are adults, we carry around tens of trillions of bacteria with us everywhere we go.

[Continued on next page]
**Trivia Answer:**
The correct answer is C. After chickenpox infection, varicella zoster virus lives silently in the nerves. As people age, their immune system weakens, sometimes leading to a reawakening of the zoster virus, causing shingles.

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**Diving into the inner-workings of the immune system** [continued]

**Training our immune systems**

Another reason the non-sterile environment is important is that it affords a baby’s immune system the opportunity to “practice” generating its own immune responses and, in the process, allows the baby to develop immunologic memory against potential pathogens. To allow a baby’s immune system time to generate its own immunologic memory, babies are first protected by maternal antibodies that either crossed the placenta or were delivered in breast milk.

**A deeper dive**

The Vaccine Education Center recently added a new section about the human immune system to its website. The section goes into much more detail about some of the ideas described above, as well as offers a variety of other information about the immune system.

**Check out the new information today:**
https://www.chop.edu/centers-programs/vaccine-education-center/human-immune-system

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**News and Notes**

**Video: The Side Effects of Vaccines**

This approximately 11-minute, animated video describes how the immune system works and how vaccines take advantage of that process to protect us from future infections. The video, titled *The Side Effects of Vaccines – How High is the Risk?*, was produced by Kurzgesagt for their *In a Nutshell* video series and was funded by a grant from the Bill & Melinda Gates Foundation.

**Find the video on YouTube:** https://www.youtube.com/watch?v=zBkVCpbNnkU

**Music video about vaccines**

Austin Jordan, a student at the University of St. Thomas in St. Paul, Minnesota, recently made a video parody of *Lil Nas X – Old Town Road*, changing the lyrics to relate to getting vaccinated. Called *Lil Nas Vax – Vaccine Road*, the video features Jordan singing and dancing in support of vaccinations.

**See the video on YouTube:** https://www.youtube.com/watch?v=x3K6zmT1WuI

An interview by Josh Stewart for *Citizen Ed* stated, “Austin has always believed that music has a very powerful effect on people. He hopes that this video will convince people to get out and get vaccinated and to combat the unfortunate trend of people spreading myths about vaccinations.”

**Read the interview:** http://citizen.education/2019/05/17/vaccine-road-this-college-students-old-town-road-parody-is-reminding-people-to-get-vaccinated/

**Video: “The Side Effects of Vaccines”**

If you are getting ready for summer travel, don’t forget about the VEC's informational sheet related to infectious diseases and travel:

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