



PARENTS PACK

MONTHLY UPDATES ABOUT
VACCINES ACROSS THE LIFESPAN

HOW MANY TRIVIA QUESTIONS ABOUT VACCINE INGREDIENTS CAN YOU ANSWER?

April 2023

Health observances are meant to shine a light on important related topics, so the public can easily stay abreast of what is new and relevant. April is a busy month when it comes to vaccines and health observances. This week (week of April 3) includes National Public Health Week, Adolescent Immunization Awareness Week, and World Health Day. Later in the month, Vaccination Week in the Americas, National Infant Immunization Week, and World Immunization Week will be observed. To celebrate these observances, we decided to replace the usual feature article narrative with some fun and interesting trivia related to vaccines and their ingredients. See how you do — and have fun!

Q 1. Which of these common household products is NOT found in some vaccines?

A. Sugar | B. Salt | C. Saffron | D. Saline

Q 2. True or False. Some vaccines contain products of porcine (pig) origin.

A. True | B. False

Q 3. A few people may get concerned if they hear that some vaccines contain formaldehyde, but some foods also contain formaldehyde. Do you know which of these foods contain formaldehyde?

A. Coffee | B. Bananas | C. Seafood | D. None of these | E. Two of these | F. All of these

Q 4. Some vaccines contain quantities of ingredients that are measurable in milligrams. A milligram is 1/1000th of a gram. Which of these is about the weight of a gram?

A. One nickel | B. One raisin | C. One sugar packet | D. One penny

Q 5. Which of these animals do we have to thank for contributing to the vaccine production process?

A. Chickens | B. Pigs | C. Cows | D. Dogs | E. None of these | F. Two of these | G. All of these

TRIVIA CORNER

What are the chemical agents in vaccines that allow for lesser quantities of active ingredients and in some cases, fewer doses, while maintaining the ability of the vaccine to be protective?

- A. Adjuvants
- B. Helper proteins
- C. Booster proteins
- D. Stabilizers

A1. The answer is (C), Saffron. Some vaccines contain each of the other items listed. The chemical name for sugar is sucrose, and that of salt is sodium chloride. Saline typically contains salt and water, but in some vaccines, it also contains additional salts that help keep the pH at levels appropriate for cells. Some of the examples that you might see on a vaccine ingredient list include phosphate buffered saline solution, histidine buffered saline, isotonic sodium chloride, and isotonic saline.

A2. The answer is (A), True. A few vaccines contain products derived from pigs. Specifically, most vaccines that contain gelatin use a porcine source. The one exception is a rabies vaccine that uses gelatin of bovine origin (RabAvert®). To see which vaccines contain gelatin, check out this page on our website.

A3. The answer is (F), All of these. Many foods contain some formaldehyde, and, in fact, our bodies produce formaldehyde during normal, required-for-life metabolic activities. As a result of food exposures and metabolic processes, the amount of formaldehyde introduced by vaccines is significantly lower than that commonly found in our bloodstream. To find out more, see our webpage about formaldehyde in vaccines. For more information about formaldehyde contained in foods, check out these two articles:

- Chemicals in Food: “Two That Aren’t As Scary As They Sound,” Food Insight, November 10, 2016
- Formaldehyde in Food: “What You Need to Know, Very Well Fit,” January 17, 2022

A4. The answer is (B), One raisin. One raisin weighs about a gram. One nickel weighs 5 grams. One sugar packet weighs 4 grams, and one penny weighs 2 1/2 grams. Can you imagine cutting your raisin into 1,000 pieces? Each piece (if you did a good job of cutting equally sized pieces) would be about a milligram. As you are probably realizing, a milligram is a very small amount. This is why the ingredients in vaccines are unlikely to cause untoward health conditions. As described by Paracelsus, a Swiss chemist and physician, “All things are poison and nothing is without poison; only the dose makes a thing not a poison.” Most of us have heard this in the form of, “the dose makes the poison.” Check out the infographics on ChemicalSafetyFacts.org for some interesting points that demonstrate Paracelsus’ statements.

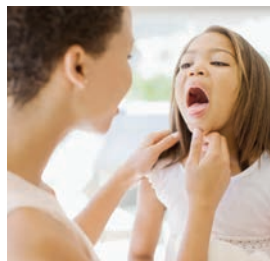
A5. The answer is (F), All of these. Some influenza vaccines are produced in eggs. As described in question 2, gelatin from pigs is used in some vaccines. A protein isolated from the serum of cows, known as bovine serum albumin, is used during the growth process for some viral vaccines, and a cell line isolated in 1958 from the kidney of a cocker spaniel is used to grow the influenza vaccine known as Flucelvax®. Because this influenza vaccine is not grown in eggs, some people with severe allergic reactions to egg protein may opt for Flucelvax. However, most people do not need to avoid influenza vaccines made in eggs because the levels of egg protein that remain are not sufficient to cause a reaction.

Thinking about how we can use products from other species to create vaccines that protect our children and families, reminds me of Dr. Maurice Hilleman. The most accomplished vaccinologist to ever live, Dr. Maurice Hilleman helped to develop more than half of the vaccines routinely given to infants today. What many people may not realize is that he also created the first vaccine against cancer. The vaccine was for chickens. It protected against a cancer called chicken lymphomatosis (otherwise known as Marek’s disease), and it revolutionized the chicken industry, making chickens affordable to most. However, the less expensive price of chickens was not what excited Dr. Hilleman the most. In discussing that vaccine, he said, “it was my repayment of the lifelong debt to the chicken.” So, during this month of vaccine observances, let’s celebrate the scientists — and the other species — that have helped make vaccines available to keep us healthy.

For links to resources, visit the Feature Article online, bit.ly/April2023FA.

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DR. HANDY'S CORNER: Let's talk about group A strep



This month's video focuses on group A *Streptococcus* (group A strep), a bacterium that causes several different illnesses in children, including strep throat, scarlet fever and skin infections. It can also cause more invasive infections, like bloodstream infections, bone infections and necrotizing fasciitis (more commonly referred to as "flesh-eating bacteria"). Recently, the Centers for Disease Control and Prevention

(CDC) announced the results of an investigation into a spike in these more invasive, and more scary, outcomes of group A strep infections.

Two points in the video are important to remember in understanding what the CDC found. First, group A strep is passed from one person to another through respiratory secretions. Second, other respiratory infections can provide an opportunity for group A strep infections to become invasive, increasing the risk in individuals sick with a primary viral infection.

The CDC investigation of data from two surveillance sites found that between October and December 2022, 34 cases of invasive group A strep were reported. In comparison between 2016-2019, those same two sites averaged 11 cases between October and December of each year.

While this finding might seem alarming, parents should realize that:

- **The rise was situational.** COVID-19 pandemic measures, including masking and distancing, led to a historic decline in group A strep infections among all age groups. Accordingly, as we returned to pre-pandemic activities, a resurgence could be anticipated, particularly as rates of common respiratory viruses rebounded.
- **Group A strep is known to seize opportunity.** The reported rise in cases of invasive group A strep coincided with a rise in hospitalizations for respiratory viruses, such as RSV and influenza. Almost half of the children had an identified viral infection that likely predisposed them to this secondary infection. As described in the video, viruses can break down the lining of the pharynx and allow bacteria, such as group A strep, to enter the bloodstream. They also can briefly modify how a person's immune system functions, allowing these types of bacteria to more easily evade the immune system.
- **Most group A strep infections will not be invasive.** Even when this bacterium takes advantage of another respiratory infection, in most cases a severe outcome requiring hospitalization will not be the result. If your child has a respiratory infection, seems to be recovering and then starts to get ill again, think about these opportunity-seeking bacteria and check with your child's healthcare provider whether they might need to be seen or receive an antibiotic.
- **Recognize that some of the viruses that predispose a child to invasive group A strep are vaccine preventable.** By ensuring that your child gets routinely recommended vaccines, like chickenpox and influenza vaccines, you can decrease their risk of these infections while also decreasing their chance of secondary bacterial infections, like group A strep. And with RSV vaccines on the horizon, parents will soon have another opportunity to protect their children.

To see the full summary of the CDC investigation, check the March 10 *Morbidity and Mortality Weekly Report (MMWR)*.

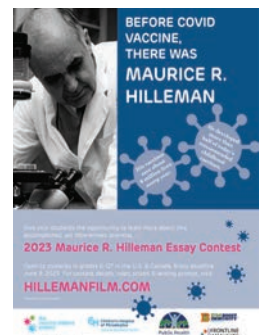
For links to resources, check out the online version, bit.ly/groupAStrep.

NEWS & NOTES

Essay contest for students in grades 6 through 12

It's that time of year again! The Vaccine Education Center's school-based program, called the Vaccine Makers Project, is hosting our annual essay contest for students in middle and high school. Known as the Maurice R. Hilleman Student Essay Contest, this opportunity is available to students in grades 6 to 12* in the U.S. and Canada. Entries must be received by June 9, 2023. To find this year's writing prompt, application and rules, go to HILLEMANSFILM.COM.

*grades 6-11 in Quebec



COVID-19: Yes, masks work, and no, it wasn't a lab leak.

Two outstanding "controversies" surrounding COVID-19 and the pandemic keep coming back to the headlines — the usefulness of masks and how the pandemic started. While media outlets benefit from revisiting these questions because it gives them content, most people just end up with mixed signals and figure that no one knows for sure. However, these questions are not controversial in the scientific community.

Masks work

Check out this blog post from Those Nerdy Girls, a group of female scientists who answered common questions throughout the pandemic. After describing the latest media rounds related to masks and examining the data, Those Nerdy Girls conclude, "Despite noise to the contrary, there is good evidence that masks are effective in reducing the risk of transmission and infection of COVID-19."

SARS-CoV-2 did not come from a lab

Pandemic viruses typically jump from an animal to humans (known as a "spillover event"), but one of the missing pieces of information about how SARS-CoV-2, the virus that causes COVID-19, made the leap was knowledge related to which animal might have incubated it before it started infecting humans. This limitation of existing knowledge, coupled with a lack of transparency and cooperation by the Chinese government, allowed for a "lab-leak" theory to gain steam.

Recently, however, more data have suggested that raccoon dogs are the source. To read up on these recent findings and see why most scientists close to the matter agree that the COVID-19 pandemic started like most other pandemics — from a spillover event, not a lab leak — check out these articles:

- The Strongest Evidence Yet That an Animal Started the Pandemic, *The Atlantic*, March 16, 2023.
- Interview with Worobey, Andersen & Holmes: The Lab Leak, *Decoding the Gurus*, Episode 67, March 11, 2023
- Spillover market with Michael Worobey, *This Week in Virology*, Episode 876, March 17, 2022.
- The Huanan Seafood Wholesale Market in Wuhan was the early epicenter of the COVID-19 pandemic, *Science*, July 26, 2022.

For links to resources, visit News & Notes online, bit.ly/April2023NN.

TRIVIA ANSWER

The correct answer is A. Adjuvants are chemicals in vaccines that allow them to generate protective immunity despite lesser quantities of active ingredients and in some cases, fewer doses. An adjuvant commonly found in vaccines in the U.S. is aluminum salts.

Go to vaccine.chop.edu/trivia to play Just the Vax, the Vaccine Education Center's trivia game, where you can find this question and others like it.

