

Science

SO MANY VACCINES

AND THE GNARLY DISEASES THEY PROTECT YOU AGAINST

BY CHELSEA LEU · ILLUSTRATION BY GIULIO B.

THESE DAYS, when you hear people talking about “the vaccine,” there’s no doubt what they’re referring to — the Covid-19 vaccine is on everyone’s mind. But when you think about it, *all* the vaccines you receive at the doctor’s office are pretty incredible. And they were thrilling news stories in their time, too.

By your late teens, you’ll probably have received

vaccines that teach your body’s immune system to recognize and fight off more than a dozen diseases. Many of them won’t ring a bell to you. But they used to sicken and kill a lot of people. Ever heard of diphtheria? Probably not — in 2018, there was only one case of it in the entire country. In the early 1900s, though, it was a leading cause of death for children. “Thanks to vaccines,

in the U.S. polio, diphtheria and tetanus are now just diseases we learn about in textbooks,” says Perri Klass, a professor of pediatrics at New York University. “That’s an unbelievable gift.” So next time your doctor tells you you’ve got a shot coming, surprise her by saying thank you. And read on to learn about all the all the vaccines doctors recommend for kids.

AGE: BIRTH

HEPATITIS B

Your very first vaccine! Babies are typically vaccinated against the hepatitis B virus within a day of being born. This is important, because the virus can be transmitted by the baby’s mother — who might not know she’s infected — and can cause serious and even life-threatening health problems.

AGE: 2 MONTHS

ROTAVIRUS

HEMOPHILUS INFLUENZAE TYPE B

PNEUMOCOCCAL DISEASE

DIPHTHERIA, TETANUS AND PERTUSSIS

A three-for-one deal: One shot gives you a dose of protection against all three of these potentially fatal bacterial diseases. Diphtheria covers the inside of your throat with a bluish-white coating that makes it hard to breathe. Tetanus causes seizures and muscle spasms. Pertussis, a.k.a. whooping cough, causes severe coughs and can infect your lungs.

POLIO

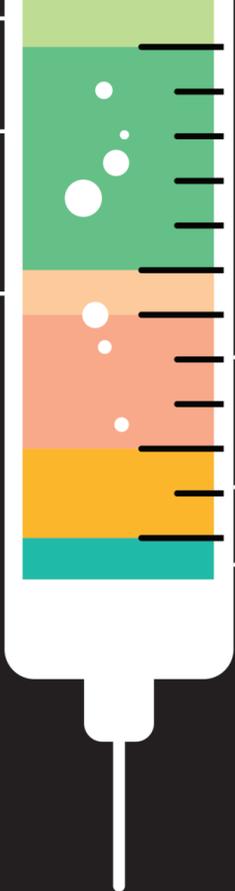
People used to be terrified of polio. In 1952 alone, the disease killed more than 3,000 people and paralyzed 21,000 in the U.S. (The virus that causes polio can destroy nerves in your spine.) During outbreaks, parents wouldn’t let their children out to play and certain towns even banned kids under 16 from entering. In 1955, when an effective vaccine was announced, the news made the front page of *The New York Times*.

A NOTE: If you’re reading this timeline and thinking, I know I’ve gotten more shots than this — you’re correct! We’re only showing the first time you’ll be vaccinated against each disease. Very often, vaccines require several doses, which is why you’ve been jabbed more times than is reflected here. For example, you need a booster shot for tetanus, diphtheria and pertussis when you’re around 11 years old — and every 10 years after that!

AGE: 6 MONTHS

THE FLU

The flu shot is a bit different from the other vaccines you get, because the influenza virus itself changes constantly. That means that scientists usually update the vaccine before each flu season, and that you should get a flu shot every single year. This may end up being the case with the Covid vaccine too, though it’s too early now to say.



AGE: 12 MONTHS

HEPATITIS A

MEASLES, MUMPS AND RUBELLA

Most kids used to contract measles, a disease that covers you with a rash and can cause fatal brain inflammation. But by 2000, the disease was declared eliminated in the United States thanks to the vaccine. Unfortunately, measles made a recent comeback, because a growing number of parents choose not to have their kids vaccinated. In 2019, there were 1,282 cases here — the highest number in nearly 30 years.

CHICKENPOX (OR VARICELLA)

If you ask your parents if they had chickenpox as a kid, the answer will probably be yes. That’s because the vaccine was only introduced in the 1990s. Parents even used to organize “chickenpox parties,” where healthy kids were exposed to sick ones on purpose. The idea was that because the symptoms are usually milder in young people, it was better to get it over with as a kid. But chickenpox can lead to rare but dangerous complications — and the itchy red blisters it causes aren’t exactly fun. So count yourself lucky to be among the first generations to not have to go through it.

AGE: 11 YEARS

HUMAN PAPILLOMAVIRUS

MENINGOCOCCAL DISEASE TYPES A, C, W AND Y

AGE: 16 YEARS

DISEASES CAUSED BY NEISSERIA MENINGITIDIS SEROGROUP B BACTERIA

Congratulations! With this last vaccine — which prevents meningitis, in which the tissues around your brain and spinal cord are infected, and one type of sepsis, in which the bacteria gets into your blood and destroys other organs — you are now protected against 16 diseases that have plagued countless people throughout history! That doesn’t mean there won’t be any more needles in your future. With some vaccines, your immunity decreases over time, so you’ll need to get booster shots every so often. And in certain circumstances, like if you travel to another country, your doctor might recommend you be vaccinated for other diseases. And of course, once it’s been approved for kids, you’ve got the covid vaccine to look forward to! ♦

VIBE CHECK: HOW ANIMALS SHOW THEY’RE HAPPY

BY LAUREL NEME

SMILE and folks know you’re happy. But what about a whale? Or an octopus? They’re a little harder to read. After all, it’s not as if we can ask an animal how it’s feeling. What researchers can do is observe animals in situations in which they’re expected to feel relaxed and content and then see how they behave. Here’s how five different creatures put out positive vibes.



OCTOPUSES CHANGE COLOR

You might already know that many octopuses can change color to blend into their surroundings, like chameleons. But when it comes to the giant Pacific octopus, the largest of the hundreds of octopus species, its skin color also reflects its mood. When it’s excited or angry, the pigment-filled sacs beneath the surface of its skin turn a fiery red; when it’s relaxed, they fade to white.



KESTRELS TUMBLE

Just like you, many animals tend to be playful when they’re in a good mood. For birds of prey like the kestrel, a tiny falcon species, that might involve an aerial performance. Craig Newman, who rescues injured birds for an organization in Vermont called Outreach for Earth Stewardship, recalls that once when he released a healed kestrel, it celebrated by flying high in the sky and then tumbling down, stopping just feet above the ground — over and over.



BELUGAS BLOW BUBBLES

In the world of a beluga whale, not all bubble-blowing is equal. Scientists who spent eight years studying belugas at a Canadian zoo identified different types of bubbles that the whales would blow, depending on how they felt. Sudden bursts indicated alarm. But when the whales were happy — for instance, when they were playing — they’d blow rings from their mouth, or slow dribbles from their blowholes.



ELEPHANTS WAG THEIR TAILS

If you should ever need to quickly assess an elephant’s mood, here’s a trick: Check its tail. As with dogs, an elephant who is happy and relaxed will wag its tail slowly from side to side. (Other good signs might be flapping ears and soft, half-closed eyes.) On the other hand, a tail that’s stiff and raised horizontal to the ground usually means an anxious elephant.



ORANGUTANS CRACK UP

Humans share 97 percent of our DNA sequence with orangutans. So it’s not surprising that we also share a way of expressing delight. Orangutans “will collapse in a helpless, giggling heap if tickled,” says Ian Singleton, conservation director of the Sumatran Orangutan Conservation Program in Indonesia. They’re very ticklish under the arms and chin — just like us. ♦

WHY WE FEEL BETTER AFTER A GOOD CRY

BY SUSAN COSIER · ILLUSTRATION BY DOMINIC KESTERTON

THINK BACK TO the last time you got really upset. Your heart pounded in your chest. Your breath sped up. And even if you tried to stop them, the tears started flowing. But then, something strange happened. After a few minutes of bawling your eyes out, you actually felt ... better. That’s because as much as we associate tears with sadness, a good cry can actually be soothing. It’s science.

Part of the calming effect is biological. When we get really agitated, our bodies go into “fight or flight” mode. That sets our hearts pumping, our lungs sucking in oxygen and, in some cases, our eyes producing tears. The act of crying, in turn, has the reverse effect, slowing us back down. When we cry, the part of our nervous system that’s responsible for our bodies’ “rest and

digest” activities kicks into gear, slowing our heart rate down and returning breathing to normal. At this point, you feel relief, says Lauren Bylsma, who studies crying at the University of Pittsburgh. The act of crying may also may spur our bodies to release chemicals that serve as mood-boosters.

Beyond the biological explanation, there’s also a social element to the feel-good effects of a good cry. Think about it: When we let ourselves sob in front of people who care about us, it’s a way of communicating our needs, letting them know we could use a hug and some comfort. And that’s a good thing. “Crying is definitely healthy,” Bylsma says. So the next time you feel the waterworks coming on, instead of trying your best to hold them back, just let them flow. ♦



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