HPV vaccine safely prevents cancer.
Here’s how we know.

Since its release, the human papillomavirus (HPV) vaccine has been embroiled in controversy. Many people with concerns question its safety; others question the need for it. Regardless, the end result is the same — young people who could be protected against some forms of cancer later in life are passing up the opportunity, either directly or as the result of a decision made by their parents.

From a public health perspective, this is like watching an unnecessary tragedy develop in slow motion. In the latest data from the CDC, released in August 2019, about 2 of every 3 teens between 13 and 17 years of age had received at least one dose of HPV vaccine, but only about half of them had completed the recommended number of doses. In contrast, in late 2018, Australia celebrated being on track to eliminate HPV as a public health problem within the next two decades. In 2016, the latest data available, about 3 of every 4 boys and 4 of every 5 girls in Australia had completed the HPV vaccine series by the age of 15 years. Australia used the quadrivalent HPV vaccine (HPV-4, Gardasil®) and switched to the nine-valent HPV vaccine in 2018.

"But is the HPV vaccine safe?"
Australia’s success means little to parents who wonder if the vaccine is safe, so let’s talk about HPV vaccine safety. We know that the HPV vaccine is safe because we have a lot of evidence.

The HPV vaccine has been given to millions of people at this point.
In the U.S. alone, more than 100 million doses of vaccine have been distributed. Even if people were getting the two or three recommended doses, which we know is not happening, that still amounts to more than 33 million people who have received the HPV vaccine. If the vaccine was causing any troubling side effects, they would have been discovered at this point.

Specific concerns related to the HPV vaccine as a cause of chronic disorders have been studied.
Summaries of many of those studies are provided on the page of our website devoted to sharing vaccine safety studies, vaccine.chop.edu/safety-references. These studies found no link between receipt of the HPV vaccine and development of the following conditions:

• Chronic fatigue syndrome or systemic exertion intolerance disease
• Chronic regional pain syndromes
• Postural orthostatic tachycardia syndrome
• Primary ovarian failure
• Venous thromboembolism (blood clots)

Researchers from China recently reviewed the existing studies about HPV vaccine and autoimmune diseases.
The type of study they did was a “systematic review and meta-analysis.” When scientists conduct a study in this manner, they systematically locate as many papers as they can about a particular topic and use criteria to evaluate the quality of each before using statistical analyses to evaluate and summarize what all of the studies together indicate about the issue, in this case what is known about the relationship between HPV vaccine and autoimmune diseases.

What is a systematic review?
Typically, during a systematic review, many papers are eliminated because they don’t meet predetermined criteria, such as:

• They are not directly related to the topic at hand.
• They are not original research studies, but rather other types of papers, like case reports, which describe a finding without performing a controlled study, or an editorial, which, like in a newspaper, is a letter by someone with knowledge offering their thoughts.
• They are not peer-reviewed. Having other scientists review a study before it is published is an important part of the research process. Think of these people as the "officials in the booth" when a questionable play occurs on the football field. They know the rules, and they make a decision based on how well the rules were followed. The main difference, however, is that when it comes to scientific publications, virtually every paper gets reviewed by the booth, not just a few questionable plays. Journals that allow papers to be published without going through the peer review process may have sound scientific papers, but often, they have papers that could not make it past the reviewers.

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What did these researchers learn about HPV vaccine safety?

Of the 541 papers located, 137 were considered close enough to the topic by virtue of their titles and abstracts that they were reviewed. Only 20 met all of the criteria for inclusion in the statistical part of the study. This may sound like a very small final number, but this shows how important it is to understand that just because a paper may seem like it is about a topic does not mean it is useful for answering a particular question. Also, of interest, of the 20 studies evaluated, five of them were determined to be of “low quality” based on their lack of scientific rigor.

In the current review, researchers determined that the HPV vaccine did not cause increases in any of the following types of autoimmune disorders:

- Neurol ogical — Disorders involving the brain or nervous system, including Bell’s palsy, epilepsy, Guillain-Barré syndrome, multiple sclerosis, narcolepsy, optic neuritis, or paralysis
- Gastrointestinal — Disorders involving the digestive tract, including inflammatory bowel disease, Crohn’s disease, ulcerative colitis, celiac disease, or autoimmune pancreatitis
- Musculoskeletal or systemic — Disorders including ankylosing spondylitis, rheumatoid or juvenile arthritis, systemic lupus erythematosus, or vasculitis
- Hematological — Disorders of the blood including autoimmune hemolytic anemia, Henoch-Schönlein purpura, and idiopathic thrombocytopenic purpura
- Dermatological — Disorders involving the skin, including scleroderma, psoriasis, and vitiligo
- Diabetes — type 1 diabetes
- Thyroid disorders— Grave’s disease, hypothyroidism, and hyperthyroidism did not correlate with receipt of HPV vaccine. On the other hand, data suggested Hashimoto’s thyroiditis may be correlated. The authors pointed out, however, that this finding was not likely to be an actual risk for a few reasons. First, the populations studied and the methodology used in the studies may have confounded the results. Second, all of the other thyroid-based diseases, in cluding hypothyroidism, which is typically caused by Hashimoto’s thyroiditis, were negative.

“But my child doesn’t need the HPV vaccine”

As a parent, it is difficult to look at your 11- or 12-year-old and envision a time when they will become mature adults involved in relationships. But in the case of the HPV vaccine, the adage by Ben Franklin, “Don’t put off until tomorrow what you can do today,” applies for a few reasons:

1. As children get older, they get busier, which means things like appointments sometimes get delayed or forgotten completely.
2. The vaccine is most effective after the last dose, which is due six to 12 months after the first dose.
3. Once teens reach 15 years of age, they need three doses instead of two.
4. Most people will be infected with HPV at some point during their lives. Most often, the infection occurs shortly after becoming sexually active. As a parent, you may or may not know when that happens.
5. The vaccine does not work after exposure to the virus. Since the vaccine protects against nine types of HPV, it can still be of value even after someone becomes sexually active, but it will not be effective against types of HPV to which the person was previously exposed. Because some of the most commonly transmitted types are the ones that cause cancers most frequently, not getting the HPV vaccine on time could still mean developing a cancer later in life.

The Vaccine Education Center regularly receives inquiries through a page on our website dedicated to answering questions about HPV, prevent-HPV.org. Some of the most frantic are those that come from individuals who themselves, their partners, or their children, recently had a positive HPV test. They are in complete and utter panic, often wondering what they should do, how they can get rid of it, and whether it is too late to be vaccinated. With a safe and effective vaccine, this scenario does not need to keep happening in homes throughout the country and the world.

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