

# NIH News in Health

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**Inside News:** 3 HPV 4 Gray Hair and Stress 4 Talking With Teens About Opioids 4 Coronavirus Resources

## Autism Spectrum Disorder Engaging in a Social World

Being social and making friends isn't always easy. Relationships have many subtleties. But people with autism spectrum disorder, or ASD, struggle more than most. For them, communicating with others can be very difficult.

Autism is called a "spectrum" disorder because it's not the same for everyone. Generally, people with autism both have difficulties with social communication and engage in repetitive behaviors.

ASD can also affect learning and problem-solving abilities. But people with ASD range from being very gifted to having severe challenges.

"Some people with ASD need a great deal of support and more extensive services, and some have a milder range of difficulties and need less support," explains Dr. Lisa Gilotty, an autism expert at NIH.

Scientists don't know the exact causes of ASD. They're working hard to understand how different factors contribute. Genes, biology, and environment all can play a role in its development.

Parents of children with ASD may notice their child doesn't respond to their name, avoids eye contact, or interacts with others only to achieve a specific goal. Kids with autism usually don't understand how to play or engage with other children.

"Typically developing children who don't have autism also have to learn how to interact with one



another," explains Dr. Dennis Wall, a child mental health and technology expert at Stanford University. "They're inherently social and go engage with others. But kids with autism aren't as social. They need to be brought into that social world."

Researchers are studying ways to better engage people with autism. They're developing tools that aid in learning emotions and interacting with others. They're also looking for ways to identify who's at risk earlier on. That way kids can get help as early as possible.

**Early Detection** • Diagnosing ASD can be difficult. There are no medical tests. Doctors can only look at a child's behavior as they age.

The symptoms of ASD usually appear around age two. That's why experts recommend children be screened for autism at their 18- and 24-month well-child visits.

"Children with autism don't look like they have symptoms in the first

year of life," says Dr. Joseph Piven, a child psychiatrist at the University of North Carolina. "Children at age six months are very social. Typically developing children can play peekaboo, laugh, and engage. The children who go on to develop autism are not distinguishable on the basis of their social behavior."

Researchers are trying to detect changes in the brain before behavioral symptoms appear. "If you can identify children at risk, you can follow their development more closely and get them into a

very early intervention program that can work to hopefully minimize that risk," Gilotty explains.

Piven's team is tracking infants' brain development using brain scans. Their studies follow infants from families that have an older child with ASD.

"We looked at the brain in the first year of life and could predict which of those children are going to get a diagnosis of autism at age two," Piven says. "We found that parts of the brain's surface basically expanded more quickly in children who developed autism than in comparison children," he says.

*continued on page 2*

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*continued from page 1*

They also found differences in how brain networks function. His team is now trying to confirm these results in studies with more children. They're recruiting infants from families with autism to participate.

**Innovative Interventions** • Getting treatment as early as possible may help change the way a child develops.

"In early infancy, the brain is considered much easier to change and so interventions may have a bigger effect," Piven says.

Current treatments for autism involve behavioral therapy. "One of the most widely used strategies is called applied behavior analysis, or ABA, therapy," explains Wall. "This therapy uses tools like flashcards to reinforce an understanding of facial emotion. So the flashcards will have happy faces and sad faces."

Wall's team has built a computerized version of this therapy. The system uses a camera on augmented-reality glasses. But instead of faces on flashcards, the camera captures the face of the actual person you're talking with. Then, it identifies the person's emotion in the glasses.

"The emotion comes in the form

of an emoji, a written word, or color. It also emits a computerized voice saying the emotion through the earpiece," Wall explains.

Kids with autism who used the technology showed improvements in social behaviors. Wall's team is now testing a complementary approach in an app to help kids learn to act out emotions. It's called "Guess What."

The app works as a game. One person holds the phone on their forehead and the other acts out the image displayed, like a surprise face. Then, you say what you think they're acting out. If you're right, you get a point and move to the next one.

"These tools are meant to be used in the same developmental windows that typically developing kids are learning emotions," Wall says. They give kids with autism the extra help they need to understand their social world.

Another group is testing theater techniques for honing social and emotional abilities. People with autism act out a play alongside their peers. The plays have different themes that deal with age-appropriate topics.

"They focus on every aspect of what someone needs to be successful in their social interactions," says Gilotty. "You have to think about your own character and what you're projecting with your face, body, voice, and gestures. But you also have to think about the other characters in a play and what they're thinking and what they're feeling and what they're projecting."

A clinical trial led by Dr. Blythe Corbett at Vanderbilt University found that people with autism who were in the plays improved in their social understanding and interactions with peers.

**Personalized Treatments** •

Because autism is different for each person, researchers are searching



## Wise Choices Signs of Autism

Children or adults with autism may:

- avoid eye contact and want to be alone.
- have difficulty making friends or interacting with peers.
- miss social cues, such as facial expressions and gestures.
- avoid or resist physical contact.
- not point at objects to show interest or not look at objects when others point at them.
- have trouble talking about their own feelings or understanding others' feelings.
- insist on familiar routines and get upset by minor changes.
- be more or less sensitive than others to the way things smell, taste, look, feel, or sound.

for ways to identify which treatments will work best for whom.

"They're looking for different markers that are associated with different types of social difficulties," Gilotty says. "If you can begin to identify those brain differences, then you can develop treatments around them."

People with ASD will face different challenges as they age. For some, symptoms may improve with age and treatment. But many will still need help as they get older. NIH-funded research also focuses on how to support the transition to adulthood.

You can be diagnosed with ASD at any age. Though symptoms show up in early childhood, they may go unnoticed until later. If you think you or your child may show signs of the condition, talk with your health care provider. ■

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**Web  
Links**

For more about autism spectrum disorder, see "Links" in the online article:  
[newsinhealth.nih.gov/2020/04/autism-spectrum-disorder](http://newsinhealth.nih.gov/2020/04/autism-spectrum-disorder)

# Protecting Against HPV

## Common Viruses Can Lead to Cancer

Human papillomavirus (HPV) is one of the most common sexually transmitted infections. There are many types of HPV. Most are fairly harmless. Some can cause genital warts, and others certain cancers.

Anyone who is sexually active can get one of these harmful types of HPV. Most people don't know they have the virus.

"Over a lifetime, up to 80% of people will be exposed to this virus," says Dr. Aimée Kreimer, an NIH expert on cancer and HPV. For most, the infection goes away on its own. The body's **immune system** controls the virus.

But some people can't successfully fight off HPV. It stays in their body and can cause health problems. Those can include genital warts or cancer in the parts of the body it infects.

Cancers related to HPV can take many years to develop after exposure. Worldwide, there are over 570,000 cases of cervical cancer each year and 311,000 deaths. HPV also causes cancer of the vulva,



People who start the HPV vaccine at age 15 or older will need three doses. The vaccine is recommended for everyone up to 26 years of age.

The HPV vaccine has also been recently approved for those 27 to 45 years old. However, HPV vaccination of people in this age range provides less benefit, as more have been already exposed to HPV.

vagina, penis, anus, and back of the throat.

Fortunately, there are vaccines that can prevent HPV infection. Getting the HPV vaccine could protect against over 90% of the cancers caused by the virus.

"We now have more than a decade of evidence that this vaccine works incredibly well to protect against HPV infections," says Kreimer.

Gardasil 9 is the HPV vaccine now used in the U.S. It protects against nine types of disease-causing HPV. When first introduced, the vaccine only protected against four HPV types.

For the HPV vaccine to be most effective, it needs to be given before exposure to the virus. The CDC recommends that both boys and girls get the HPV vaccine at age 11 or 12. At this age, the vaccine is given in two doses.

"If you start the vaccine early, you provide protection starting from that age onward," says Dr. Carolyn Deal, an NIH expert on sexually transmitted diseases.

Since the vaccine was introduced, HPV infection rates have fallen dramatically. Among teen girls, infections with the types of HPV that cause genital warts and cancer have dropped by 86%.

"It's a highly effective vaccine," Deal says. "Cervical cancer is a devastating disease and, through vaccination, we have the potential to reduce it or even eliminate it down the road."

In addition to getting vaccinated, if you're sexually active, use condoms every time you have sex. This reduces your chances of getting HPV and other sexually transmitted infections.

Women ages 21 to 65 should also get screened for cervical cancer routinely. ■



### Wise Choices

Who should get the HPV vaccine?

- All boys and girls ages 11 to 12.
- Everyone through age 26 years, if you're not already vaccinated.
- Some adults aged 27 through 45 years, but benefits in this age range tend to be minimal. Those concerned about their risk of infection should consult with their health care provider.



### Definitions

#### Immune System

The system that protects your body from invading viruses, bacteria, and other microscopic threats.



### Web Links

For more about HPV, see "Links" in the online article: [newsinhealth.nih.gov/2020/04/protecting-against-hpv](https://newsinhealth.nih.gov/2020/04/protecting-against-hpv)



## Health Capsules

For links to more information, please visit our website and see these stories online.

### How Stress Causes Gray Hair

A new study shows that stress really can give you gray hair. Researchers found that the body's fight-or-flight response plays a key role in turning hair gray.

Your hair color is determined by pigment-producing cells called melanocytes. New melanocytes are made from melanocyte stem cells that live in the hair follicle at the base of your hair strand.

As we age, these stem cells gradually disappear. The researchers showed that stress also leads to the

loss of these pigment-producing stem cells in mice.

Nerves in your sympathetic nervous system—which is responsible for the body's fight-or-flight response—go throughout the body, including into hair follicles. The study showed that stress causes the release of the chemical norepinephrine into the follicle.

Norepinephrine affects the melanocyte stem cells living there. It causes them to rapidly turn into pigment cells and move out of the

hair follicles. Without stem cells left to create new pigment cells, new hair turns gray or white.

“When we started to study this, I expected that stress was bad for the body—but the detrimental impact of stress that we discovered was beyond what I imagined,” says Dr. Ya-Chieh Hsu of Harvard University, who led the study. “After just a few days, all of the melanocyte stem cells were lost. Once they’re gone, you can’t regenerate pigments anymore. The damage is permanent.” ■

### Opioid Facts for Parents

If you're a parent, you may wonder how to talk about opioids with your child. By knowing the facts, you can have an open conversation with your child about the risks. You'll also be better able to spot signs of a problem with opioids. NIH has developed a guide to help you begin the conversation.

Opioids include medications like prescription painkillers and illegal drugs like heroin. They work by blocking pain signals sent from the brain to the body. At the same time, they release large amounts of

dopamine—a chemical in the brain that can make the user want to repeat the experience.

Opioids are among the most addictive drugs. Over time, they can lead to brain changes that cause a strong need to take the drug again. These changes explain why some people who are addicted to opioids continue to take them despite negative consequences.

Children and teens are more likely than adults to become addicted to drugs. That's why it's important to talk with your child early.

Start by being a good listener. Explain the risks of misusing opioids, including the danger to a developing brain. Set clear expectations for your child about avoiding opioids and other drugs. And work to keep those channels of communication open.

Having this important conversation can help kids make better decisions. To learn more, visit: [www.drugabuse.gov/publications/opioids-facts-parents-need-to-know/talking-to-your-kids-communicating-risks](http://www.drugabuse.gov/publications/opioids-facts-parents-need-to-know/talking-to-your-kids-communicating-risks). ■



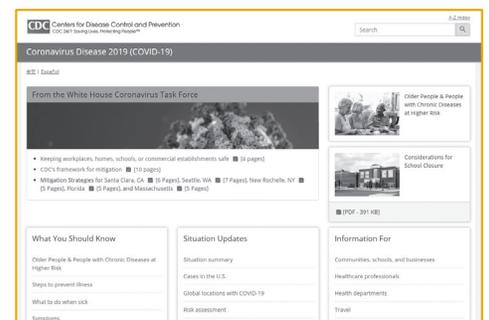
### Featured Website

Coronavirus Disease (COVID-19)

[www.coronavirus.gov](http://www.coronavirus.gov)

Get the latest information on the coronavirus (COVID-19) outbreak all in one place. Learn science-based recommendations on how

best to protect you and your family. Find the facts about the situation in the U.S. as it evolves.



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