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NIH MedlinePlus

Trusted Health
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of Health

MAGAZINE

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migraines

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WOMEN'S HEALTH

Promoting healthy pregnancies

NICHHD Director Diana Bianchi on efforts to improve maternal health

The National Institute of Child Health and Human Development (NICHD) is excited to work with the National Library of Medicine on NIH MedlinePlus magazine to highlight research to reduce pregnancy-related complications and deaths and ensure healthy outcomes for mothers and their children.

This issue's cover star is Olympic sprinter Allyson Felix, who is the most decorated American track and field athlete in Olympic history. She shares her story of being diagnosed with severe preeclampsia, a life-threatening, pregnancy-related disorder that results in high blood pressure and multiple organ failures. Allyson's diagnosis led to the birth of her daughter, Camryn, by emergency cesarean section two months early. Happily, both Allyson and Camryn are thriving today, but their

experience underscores the urgent need to address the maternal health crisis in the U.S.

According to the Centers for Disease Control and Prevention, nearly 700 women in the U.S. die each year of complications from pregnancy or giving birth, and such deaths are more likely to occur among Black and American Indian/Alaska Native women, compared with white women. Most of these deaths are preventable.

Understanding and reducing pregnancy-related complications and deaths is a high priority for NIH. In this issue, we share NICHD-funded research on reducing health disparities related to pregnancy and childbirth and on improving pregnancy outcomes to maximize the lifelong health of women and their children. We also highlight



Diana W. Bianchi, M.D.

how research is helping to inform medical care for pregnant people during the COVID-19 pandemic.

I often say that pregnancy acts as a stress test that can predict a woman's health in later life. It also plays a significant role in the lifelong health of her child or children. Researchers at NICHD and other institutions remain committed to generating robust scientific evidence to guide clinical care and eliminate health disparities during pregnancy and childbirth and after delivery.

Thank you for reading!

Diana W. Bianchi, M.D.
Director, NICHD

NIH MedlinePlus MAGAZINE

WHO WE ARE

The National Institutes of Health (NIH) is the **nation's premier medical research agency**, with 27 different institutes and centers. The National Library of Medicine (NLM) at NIH is a leader in research in biomedical informatics and data science research and the world's largest medical library.

NLM provides **free, trusted health information** to you at medlineplus.gov and in this magazine. Visit us at magazine.medlineplus.gov

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Olympic track and field star Allyson Felix was diagnosed with preeclampsia in 2018 while pregnant with her daughter, Cammy.

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The National
Cancer Act:
50 years later

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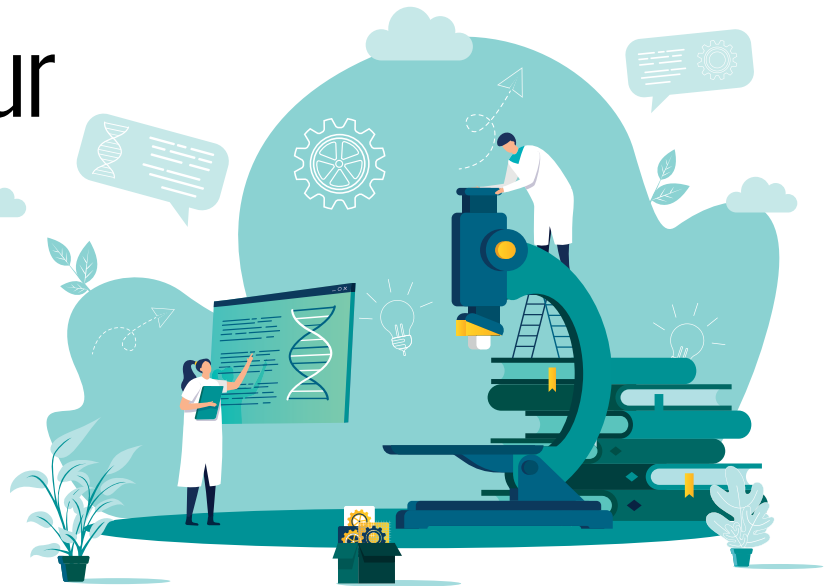
to
your

health

NEWS,
NOTES,
& TIPS
FROM NIH

Learn about your genes with MedlinePlus

Genetics Home Reference is now part of MedlinePlus, an online health and wellness resource from the National Library of Medicine



NEW ON MEDLINEPLUS Most of us know that traits like eye color, height, and even some of our behaviors are related to our genes. But do you know what makes up a gene, or how genes work? Have you ever wondered about DNA, RNA, or mRNA? It can seem confusing, but MedlinePlus can help you make sense of it all.

Detailed information about genes and genetic conditions has been added to MedlinePlus, an online health and wellness resource from the National Library of Medicine (NLM). This information, which is from the former NLM website Genetics Home Reference, is available under the heading “MedlinePlus Genetics.”

You already know you can go to MedlinePlus to learn about health and wellness, medical tests, and more. Now, it’s also a comprehensive resource for information on genetics. So, you can find even more easy-to-understand health information in one convenient place.

A helpful handbook on genetics

MedlinePlus Genetics features an illustrated, easy-to-read handbook, “Help Me Understand Genetics.” Here you can read straightforward information about genetic testing, gene therapy, and genetic research. The handbook also covers:

- Clear definitions of genetic terms, such as genes and DNA
- An explanation of gene variants and how they can cause disorders
- A basic description of how genes work
- What it means to have an inherited genetic condition
- Information on precision medicine, a treatment approach designed around a person’s unique genetic makeup, environment, and lifestyle

IMAGE: ADOBE STOCK

MedlinePlus Genetics includes articles on more than 1,400 genes and 1,300 genetic conditions.

Genetics from A to Z

MedlinePlus Genetics also includes articles on more than 1,400 genes and 1,300 genetic conditions. For example, there are entries on alopecia areata, Hashimoto thyroiditis, migraine, and others.

Learn about:

- The function of individual genes and how genetic changes can impact your health
- The symptoms and causes of genetic disorders
- Chromosomes, the parts of cells that contain your genes
- Mitochondrial DNA, a special type of genetic material

Ready to dive into genetics information now? Visit [MedlinePlus.gov](https://www.MedlinePlus.gov). ■

SOURCE: MedlinePlus

DID YOU KNOW?



Females have **two copies of the X** chromosome, while **males** have **one X and one Y** chromosome.

SOURCE: MedlinePlus

October is National Disability Employment Awareness Month

BY THE NUMBERS Held every October, National Disability Employment Awareness Month (NDEAM) is a fitting time to focus on the important and diverse contributions from people with disabilities. The 2021 NDEAM theme will be “America’s Recovery: Powered by Inclusion” and will celebrate the many contributions of America’s workers with disabilities.

About one in four people in the U.S. has a disability, which is any condition of body or mind that can make it more difficult to do certain activities or interact with others. A disability can affect a person’s vision, movement, thinking, communicating, or relationships.

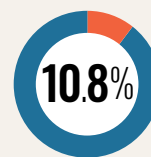
Some people are born with a disability, while others may have them due to age, illness, or injury. Although people with disabilities sometimes refers to a single population, this is actually a diverse group of people with a wide range of needs.

Research from the National Institutes of Health works to improve the lives of those with disabilities.



61 million adults in the U.S. live with a disability.

10.8% of these adults have a disability that makes it hard to concentrate, remember things, or make decisions.



In the U.S., **1 in 4 women** has a disability.



13.7% of people have difficulty walking or climbing stairs, which is also known as a mobility disability.

SOURCE: Centers for Disease Control and Prevention

The legacy of the National Cancer Act: 50 years later

National Cancer Institute director explains how cancer research turns into cures



RESEARCH In 1971, President Nixon signed the National Cancer Act as part of the War on Cancer. In honor of the act's 50th anniversary, Norman Sharpless, M.D., director of the National Cancer Institute (NCI), shares his thoughts on cancer research and treatment, and how both have changed over the past 50 years.

What was cancer like before the passage of the National Cancer Act?

In most cases, cancer was an automatic death sentence. I can think of one exception that offered real hope. In the 1950s, a group of science leaders found a cure for an especially terrible childhood leukemia. The survival rate increased from zero to more than 80%.

Why couldn't that dramatic change happen for all cancers? That kind of thinking led to support for the National Cancer Act. At the time, some people believed cancer was a medical problem that could be solved in about five years. It was simply a matter of finding the right drugs. But of course, cancer turned out to be a much harder problem.

Why is cancer so hard to solve?

We now understand that cancer is different between patients. In a way, cancers are like snowflakes. Each one is unique.

Cancer is not one disease or even 10, it's hundreds or thousands of diseases. Each cancer has its own treatment and approach. In the past, we tried the same ineffective cancer drugs over and over. Now we're starting to see real advances on specific cancers.

We're committed to President Biden's goal to end the tragedy of cancer that takes loved ones too soon. About 600,000 Americans die from cancer each year. So, we have a lot of work to do.

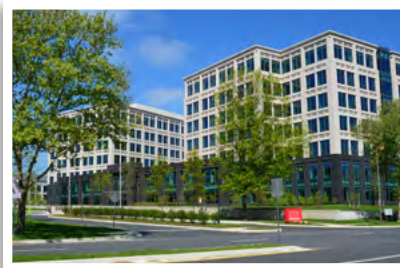


Norman Sharpless, M.D., was sworn in as the director of the National Cancer Institute in 2017.

IMAGES: ISTOCK; NIH

“Cancer is not one disease or even 10, it’s hundreds or thousands of diseases. Each cancer has its own treatment and approach.”

– Norman Sharpless, M.D.



National Cancer Institute, Shady Grove Campus, in Rockville, MD

How does big data play a role?

We’ve moved away from traditional clinical trials. We no longer give drug A to 400 people and drug B to another 400 and compare outcomes. All 800 patients are different, and we can’t treat them in a cookie-cutter way. We link lots of data sources, from lab reports to insurance claims. Analyzing large amounts of data helps us understand cancer in the real world. For example, treatments that work in big, urban hospitals may not work in areas with low access to care.

How did COVID-19 affect cancer care and clinical trials?

COVID-19 caused major delays in treatment and surgeries. It drastically reduced screening tests like Pap smears and mammography. Yet I’m impressed with how the cancer world rallied to decrease the impact of the pandemic. That means getting patients into treatment quickly and making up missed tests.

Clinical trials are critical to advancing cancer research. NCI enrolls more than 35,000 participants

annually. Participants benefit from access to new therapies. Increasing the diversity of our participants is a priority. This includes bringing trials to patients and making them more convenient.

Early in the pandemic, we had to learn how to use telemedicine for clinical trials. We obtained consent by phone. We mailed drugs. We found treatment closer to home. Patients, caregivers, and clinicians liked these changes. As we move forward, these lessons will help increase access to clinical trials and care.

What else can you tell us about cancer research today?

We’re in a golden age. At NCI, we have more research ideas than we can fund. For example, myeloma has at least five new approaches to treatment. The challenge is to figure out how to use these techniques.

To make progress in cancer, we need to understand it. The incredible results we see in some cancers builds on decades of basic research. You cannot skip that step. Science is surprising and unpredictable. We don’t know where the next breakthrough will come from.



Dr. Jonathan Hartwell (right) and his assistant Sylvy R. Levy Kornberg conduct some of the earliest chemotherapy tests at the National Cancer Institute, circa 1950.

Take metastatic melanoma, a great success story. It had a very low survival rate. It may have looked like nothing changed for decades. Then, all of a sudden, we gained new knowledge about the immune system. And within five years, scientists found a cure. That would have not happened without the prior 30 years of hard work.

While I’ve focused on NCI’s work, progress against cancer is a National Institutes of Health-wide effort. For information about clinical trials, patients should talk to their doctor and visit our website. ■

Listen to NCI’s 50th anniversary podcast series on HealthCast



For a close-up look at past and present cancer research and innovation, listen to this special podcast miniseries: 50 Years of the National Cancer Act. Each podcast is about 30 minutes long, and topics include prevention, treatment, clinical trials, health disparities, and more. Listen on Spotify, Apple Podcasts, or wherever you get your podcasts.



MIGRAINES

What you need to know

Migraine triggers, such as stress, are different from person to person

Migraines are more than just a headache. They can sometimes cause vomiting, exhaustion, irritability, and intense pain that can make it hard to do daily activities.

“Before a migraine, you might get hit with a wave of fatigue or yawning,” says Linda Porter, Ph.D., of the National Institute of Neurological Disorders and Stroke. “After the pain and severity goes away, people can have fatigue, brain fog, or high sensitivity to light.”

In addition to a painful headache that often happens on one side of the head, other symptoms include mood changes, food cravings, nausea, and aura. Aura creates flashing, bright lights or “zigzags” in your field of vision. These additional symptoms and aura usually happen prior to a headache and can often suggest to migraine sufferers that the headache is on the way.

Who gets migraines?

Women are three times more likely to suffer from migraines than men. Hormonal changes, like menstrual cycles or pregnancy, can often lead to migraines. Most women see improvement after menopause. Children can also get migraines.

Causes

Migraine triggers differ widely from person to person. These include stress, hormone changes, sleep cycle changes, dehydration, loud sounds, strong smells, sudden changes in environment, and tobacco or caffeine use. However, caffeine withdrawal can also cause migraines.

Additionally, certain foods—like alcohol, chocolate, cheese, and yeast—can cause migraines, especially when combined with other triggers.

“Before a migraine, you might get hit with a wave of fatigue or yawning.”

– Linda Porter, Ph.D.

How they're treated

In addition to rest, certain prescription drugs and over-the-counter oral medicines like ibuprofen, aspirin, or acetaminophen can help relieve pain and restore function. Other medicines, which are often taken daily, can help prevent migraines. ■

Migraine studies look at impact of lifestyle changes

Researchers test headache diary app and stress management interventions

Women are three times more likely than men to experience migraines. Much of this can be attributed to hormonal changes like pregnancy and menstruation.

However, when it comes to improving migraine treatment specifically for women, research coordinator Linda Porter, Ph.D., of the National Institute of Neurological Disorders and Stroke (NINDS), says it is important to study both men and women.

“That information helps you learn how migraines differ in the sexes,” Dr. Porter says. “That will help develop therapies that are more targeted to women.”

One such study is focused on migraine tracking and how to best engage people who have trouble tracking their headaches effectively.

Participants filled out a headache diary on their smartphone app three times a day for 20 days. Some



Linda Porter, Ph.D.



Michael Oshinsky, Ph.D.

Researchers are using nerve stimulation and stress management to help track and treat migraine pain.

participants continued to make headache diaries for another two months. For those who weren't able to complete daily migraine diaries for the first 20 days, researchers worked with them to find other options to help. They were given either a support tool or educational support through the same app for three months.

Another NINDS-supported study zeroes in on better understanding one of the most common migraine triggers: stress. Though stress affects both men and women, women are historically more likely to report stress than men.

Researchers are using nerve stimulation and stress management to help track and treat migraine pain, says Michael Oshinsky, Ph.D., of NINDS.

They're specifically focused on the vagus nerve, which is the main nerve that stems from the brain. It helps control important body functions that give us energy.

In this study, researchers stimulate the nerve to see if that helps relieve participants' migraine pain. Participants will also get training on how to reduce stress. ■

TRIGGER FOODS FOR MIGRAINES

Certain foods—like alcohol, chocolate, cheese, and yeast—**can cause migraines**, especially when combined with other triggers.

SOURCE: Centers for Disease Control and Prevention



“When migraines are bad, it’s important to take care of yourself and find the best way to get relief.”

– Brianna Shevlin

Not all headaches are the same

Migraine sufferer learns that symptoms, effects change over time

Brianna Shevlin, a 34-year-old special education teacher and reading interventionist, has had migraines since she was in high school.

“I don’t think I realized what I was having were migraines right away,” she says.

At first, she thought they were just bad headaches.

PERSONAL STORY

For instance, when her mother got migraines, she would spend the day in her bedroom with the door closed and the lights off. Brianna thought that

since she didn’t have the same reaction, it really wasn’t a migraine. But the headaches kept coming.

Seeking out a specialist

Finally, Brianna went to see a neurologist to see what was causing her headaches. The neurologist ordered a magnetic resonance imaging (MRI) of her brain, which showed that it was abnormally close to her skull. This, as well as having a parent who experienced migraines, likely contributed to her migraines, the neurologist said.

The doctor reviewed the MRI and asked Brianna about her symptoms, which included pain in her temples that lasted more than three days, nausea, fatigue, and dizziness. She was diagnosed with migraines and prescribed a medication that is typically used to treat high blood pressure to help her manage the pain.

Ups and downs with migraines

As she’s gotten older, Brianna has had a mix of severe and less intense migraines.

When she was 22, she experienced a migraine while she was teaching. For the first time, one of her symptoms was a migraine aura. An aura causes a person to see abnormal haze, light, or static in their field of vision. Brianna didn’t know what was happening.

“I thought I was having a stroke,” Brianna says. “I couldn’t focus, and the whole room was swirling. Then one side of my vision turned static. I couldn’t feel the left side of my body or see out of my left eye.”

Brianna's aunt took her to the hospital immediately to have her checked. It turned out that she had a very bad migraine and not a stroke. It was a difficult experience as her mother was in the same hospital beginning her first round of chemotherapy.

"My grandparents were there, and they were taking shifts checking in on me and my mom," she recalls.

3%

Headaches overall account for about **3% of all emergency department visits** annually in the United States.

SOURCE: Centers for Disease Control and Prevention

Although the severity of her migraines has increased as she has gotten older, Brianna has refined her treatment so that she can treat them more effectively.

Now, when she feels a migraine coming on, she takes sumatriptan, a prescription medication, to help reduce pain. Brianna also makes sure to drink plenty of water and get enough sleep to help keep her migraines under control. She works closely with her neurologist and primary care physician to ensure she is on the right medications with the best course of treatment.

Taking time to rest and get support

Brianna has found ways to manage her schedule when a migraine hits.

For instance, she's let her co-workers and families she works with after school know that she gets them and may have to cancel or need extra support.

"When migraines are bad, it's important to take care of yourself and find the best way to get relief," Brianna adds. ■

Helping friends and family understand migraines

Teamwork, support play a role in relief

Many people with migraines experience stigma. For example, others may not believe their migraine pain is real or that bad, and may treat them negatively because of it.

"Stigma is very important in understanding how someone with migraines interacts with other people around them," said Michael Oshinsky, Ph.D., a program director at the National Institute of Neurological Disorders and Stroke (NINDS). "They've often experienced times in their life when other people do not take their neurological disorder seriously. For example, saying, 'You can just work through it, it's just a headache,' when that's not the case."

Stigma can make people hesitant to take time off during a bad migraine and sometimes hesitant to seek treatment. But getting care and consulting a health professional should be a priority for migraine sufferers. Here are three things Dr. Oshinsky recommends that can empower people with migraines:

1. Educate yourself

"The individual suffering from migraines will gain a lot from educating themselves about this disorder," Dr. Oshinsky says. He suggests seeking out NINDS resources online to learn about migraines. The more you know about them, the more likely you are to seek help when you need it.



2. Educate others

"Once the person feels educated and understands the complexity of the neurological disorder that migraine is, they can talk to other people when they're experiencing a migraine," Dr. Oshinsky says. "They can discuss the other associated symptoms and the intense pain of their experience. That will help other people to understand."



3. Be honest when you feel pain

It's important to be honest about what symptoms you feel when you have a migraine. When people realize you are experiencing pain so intense you get nauseous, or symptoms like confusion and sensitivity to light and sound, "the idea of 'It's just a headache' doesn't pan out," Dr. Oshinsky says. ■



A CHAMPION FOR MATERNAL HEALTH

Olympic track star Allyson Felix advocates for other women after preeclampsia

Allyson Felix after winning the 400-meter Olympic bronze medal in Tokyo.



Rigorous training and preparation has helped Allyson Felix win 11 Olympic medals, two of which she won this past summer at the Tokyo Olympics. She now holds the record as the most decorated American track and field athlete in Olympic history.

Felix approached having a healthy baby with the same dedication. But doctors had to rush to save Felix and her daughter when she developed severe preeclampsia after 32 weeks of pregnancy. Her unexpected pregnancy complications have driven Felix to become a champion for improved women's and maternal

health. She shared her experiences and her passion to help others with NIH MedlinePlus magazine.

When and how did you find out you were having pregnancy complications?

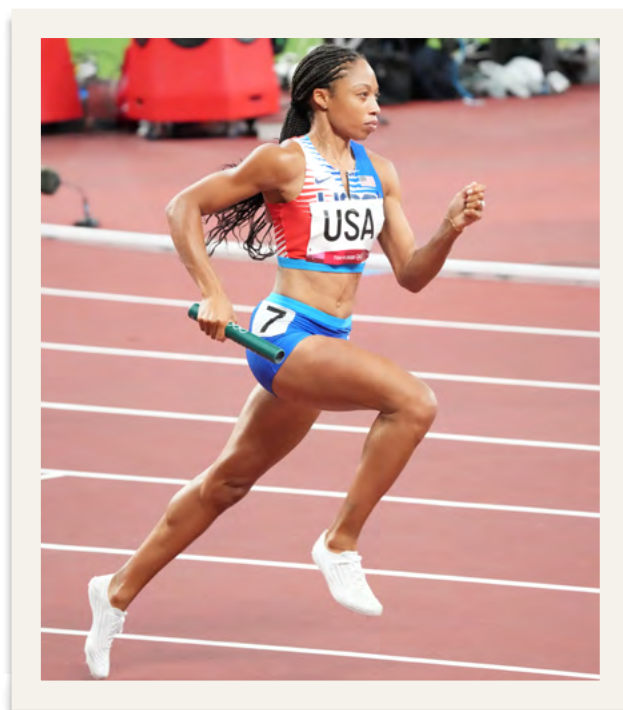
I thought I had done everything right. I studied and I went to birthing classes. I even had a birth plan. I was running, swimming, and lifting weights. So, I was feeling really strong and prepared to have a healthy, natural birth.

It all changed at a routine prenatal check-in when I was 32 weeks pregnant. During the appointment, the doctor came in and said she

wanted me to be hooked up to a [blood pressure] monitor. I was surprised but thought that it might just be normal. When the doctor came back in, she said she had some concerns and wanted to send me to the hospital for further testing. At the hospital they ran tests and decided they needed to admit me. They said I had severe preeclampsia, including elevated levels of protein in my urine and high blood pressure. That is when it got really scary. I will never forget when the doctor ran in and said that we can't wait any longer, we are going to have to rush you in for an emergency C-section.

“I want women to be aware. To know they are at risk. To know the signs to look for.”

– Allyson Felix



Allyson Felix competes in the gold medal-winning 4x400-meter relay at the Tokyo Olympics.

What thoughts did you have after your diagnosis?

My heart kind of sank, and I became concerned. I had heard the statistics of Black women being at greater risk of complications during pregnancy, but as a professional athlete, I never imagined that statistic could be me. When we heard that they needed to do an emergency C-section, I was scared and terrified about this tiny baby who wasn't ready to come into the world yet. I wasn't at all thinking about my own health. I just wanted a healthy baby.

What is your message to other women based on your experience?

I want women to be aware. To know they are at risk. To know the signs to look for. To speak up and to always bring forth when there is an issue or something doesn't feel right. This may take more of an effort than it should, but it is necessary. For women, and for Black women particularly, we know from studies that too often our pain isn't perceived as real and isn't taken seriously. It is easy to be intimidated when you are in your doctor's office. But you have to advocate for yourself. You need to be heard.

I recently joined the Centers for Disease Control and Prevention's HEAR HER campaign to share my story and help educate women about the warning signs and ultimately to advocate for themselves.

What led you to speak out and advocate for maternal health?

I'm so grateful for how everything turned out for us and for the care that we received. But it was that experience that really opened my eyes to this whole other world of what women are going through and the risks associated with that, especially for Black women. Once my eyes were opened, I wanted to get involved and see what I could do. In 2019, I shared my testimony with Congress in the larger discussion of public health reform and have had the honor of being on the March of Dimes Celebrity Council to continue as an advocate for maternal health.

How important were family and loved ones throughout this experience?

Looking back on such a scary experience, I feel really blessed that I have had such amazing support from my family and partner. Having my husband there to help me make some decisions was key. The ability to lean on someone else was so important.

How are you and your daughter doing now?

Cammy was born at just 3 pounds, 7 ounces and spent the first month of her life in the neonatal intensive care unit at the hospital. But she is a healthy, bright, and growing toddler now. She was with me at the Olympic trials. I just wanted to really show her, no matter what, that you do things with character and integrity, and you don't give up. Having her as a motivation these past few years has just given me a whole new drive. ■

Updates on COVID-19 vaccines in pregnant people

Study finds two doses of vaccines needed for protection

Andrea Edlow, M.D., is a maternal-fetal medicine specialist at Massachusetts General Hospital. When COVID-19 hit, her lab began researching the immune response in vaccinated pregnant and lactating individuals. She shares the results of this study, which is supported by the National Institute of Child Health and Human Development, and provides a peek into more COVID-19 research to come.

What was the reason for studying immune responses to the Pfizer and Moderna vaccines in pregnant people?

Prior to the last decade, there was a more simplistic understanding of pregnancy immunity. It was assumed that pregnant people were in an immune-suppressed state so they would not reject the fetus.

But pregnancy is not a static immune state—it's in flux. Pregnant people may respond to vaccines differently at different points in pregnancy. There might also be reason to think that pregnant individuals could respond to vaccines differently than nonpregnant people because the general immune state of pregnancy is unique.

The same is true with lactation, or breastfeeding. During the postpartum period, pregnant people return to a more nonpregnant immune state.



Andrea Edlow, M.D., and her research team studied how pregnancy and lactation affect a woman's COVID-19 immunity following vaccination.

“It's really important for pregnant and lactating people to adhere to the dosing schedule of the vaccine.”

– Andrea Edlow, M.D.

This timeframe isn't well-studied. So, the questions we wanted to ask were, “Do pregnant and lactating individuals respond to the vaccine the same as nonpregnant people of the same ages?” and “Are lactating individuals' responses different from those of pregnant individuals?”

How did you study this?

We measured this by looking at the antibody response of pregnant individuals compared to nonpregnant individuals. We measured antibody levels before vaccination, after the first dose of the vaccine, and then about four weeks after the second dose of the vaccine.

What did the research find?

Unfortunately, we found that pregnant and lactating people are relatively less protected after the first dose of the vaccines compared to nonpregnant people. After the second dose, both groups were relatively at the same spot. This was an interesting finding because it suggests that it's really important for pregnant and lactating people to adhere to the dosing schedule of the vaccine.

We also found that vaccinated lactating people made amazing levels of antibodies that were significantly higher than both nonpregnant and pregnant people. This shows that lactation is indeed a mysterious immune time that we don't know very much about.

Pregnant during COVID-19?

Tips to stay safe

Get vaccinated and follow CDC mask guidelines

Why are these findings important?

These findings are especially important today with the Delta variant strain of the COVID-19 virus. We now know that pregnant and lactating people who are half vaccinated are hardly protected against it, so it's extremely important for them to be cautious until they are fully vaccinated.

What other research is on the horizon?

Research has found that a side benefit of being vaccinated during pregnancy is that some of the antibodies the mother makes cross the placenta and protect the infant for a period of time. Right now, we're investigating exactly how long that protection might last. We're also looking into whether the antibodies that the mother makes can be passed to the infant via breast milk. ■

As of August 2021, the Centers for Disease Control and Prevention (CDC) strongly recommends that all pregnant people get vaccinated against COVID-19. Visit [cdc.gov](https://www.cdc.gov) for the latest information on COVID-19.

Pregnant people with COVID-19 are at **increased risk for preterm birth.**

SOURCE: Centers for Disease Control and Prevention

Pregnant people are at an increased risk for severe illness from COVID-19 compared with nonpregnant people. Andrea Edlow, M.D., a maternal-fetal medicine specialist at Massachusetts General Hospital, says that's why it's very important for pregnant people to take this virus seriously and get vaccinated.

These six things can help you stay safe during your pregnancy. Make sure to always check with your obstetrician or other health care provider if you have questions.



Ensure you and those who live with you get vaccinated if they are eligible. Remember that if you are getting a two-dose vaccine series, like Moderna or Pfizer, you will not be considered fully vaccinated until two weeks after receiving your second dose.



Limit in-person interactions with people who may have been exposed to the virus, including those people in your household.

Wear a mask in indoor public places. Keep space between yourself and others in crowded spaces. Stay updated on the latest Centers for Disease Control and Prevention (CDC) mask and other guidelines.



If you are fully vaccinated and have a preexisting condition other than pregnancy or are taking medications that weaken your immune system, you may need to take additional steps to protect yourself.

Wash your hands frequently with an alcohol-based sanitizer or soap and water. Avoid touching your eyes, nose, and mouth.



Check with your health care provider and hospital or other birthing location to learn about their COVID-19 guidelines before you go. Some hospitals only allow a certain number of people in the delivery room, for example.

As of August 2021, the CDC strongly recommends that all pregnant people get vaccinated against COVID-19. Visit [cdc.gov](https://www.cdc.gov) for the latest information on COVID-19. ■

SOURCES: National Institute of Child Health and Human Development; Centers for Disease Control and Prevention



Reducing health disparities around pregnancy

Research looks at environmental impact on women



Juanita Chinn, Ph.D., oversees health disparity research at NICHD.

“These lines of research push beyond individual health behaviors to fully understand the impact of the environment.”

– Juanita Chinn, Ph.D.

pregnancy-related health problems and deaths, such as hypertension and preeclampsia, but we don’t talk enough about the social causes of disease,” she says.

A variety of recent NIH-supported research reveals the growing problem of health disparities in maternal

Despite many medical advances and improvements in maternal health care, significant health disparities in the care of pregnant people still exist today. We talked with Juanita Chinn, Ph.D., program director in the Population Dynamics Branch at the National Institute of Child Health and Human Development (NICHD) at the National Institutes of Health (NIH).

Health disparities are health differences that are closely linked with a social, economic, or environmental disadvantage, according to the Office of Disease Prevention and Health

Promotion at the U.S. Department of Health and Human Services. These disparities negatively impact groups of people who have experienced greater obstacles to health based on their race or ethnicity.

In the U.S., for example, Black women are three to four times more likely to die from pregnancy-related causes than white women, regardless of education and access to care. Black women are also more than twice as likely to experience a stillbirth, and Black infants are more than twice as likely to die in their first year, compared with white women.

“We’re all going to die someday, but when and how you die is determined in large part by your social landscape and your social experiences,” Dr. Chinn says. “Those should not determine how long you live.”

These alarming examples show why reducing health disparities around pregnancy and childbirth is critical, Dr. Chinn says.

“We can identify clinical factors that put women at greater risk for

Black women are **three to four times more likely** to die of pregnancy-related causes than white women.

SOURCE: Centers for Disease Control and Prevention

health and care. It also emphasizes the need for new ways to improve pregnancy and birth outcomes.

One recent study, led by Rachel Hardeman, Ph.D., looked at whether women had worse birth outcomes following events in Minneapolis, Minnesota in 2020. More than half of the women studied reported feeling like the events affected their current pregnancy. Later, nearly 60% of those women gave birth to preterm babies who were underweight or died.

Another recent study, led by Maeve Wallace, Ph.D., looked at nonpregnancy-related causes of death during pregnancy and the year after birth in Louisiana. Of the 119 pregnancy-associated deaths during 2016 and 2017,

13% were homicides. Researchers estimated that for every 100,000 women who were pregnant or postpartum, there were 13 homicide deaths. This outnumbered deaths from any single obstetric cause, including blood pressure disorders and amniotic fluid entering the blood.

“These lines of research push beyond individual health behaviors to fully understand the impact of the environment—inclusive of the social environment—on disparities in severe maternal morbidity and maternal mortality,” Dr. Chinn says. “Hopefully, this will also aid in the identification of opportunities for intervention and prevention of these adverse maternal outcomes.” ■

By the numbers: Health disparities in pregnancy

700 women die each year of complications

700

Approximately **700 women die each year in the U.S.** as a result of pregnancy-related complications.

4x

American Indian/Alaska Native women and African American women are **2 to 4 times more likely to die** from pregnancy-related causes than white women.

1.5x

Black women under age 20 are **1.5 times more likely to die** from pregnancy-related causes than white women in the same age group.

4.3x

Black women ages 30–34 are **4.3 times more likely to die** from pregnancy-related causes than white women of the same ages.

2x

In the U.S., stillbirths are more than **twice as likely** among Black women than among white women.

2/3

Approximately **two-thirds of all pregnancy-related deaths may be preventable**, supporting the need for more research to improve maternal health outcomes.

SOURCES: National Institute of Child Health and Human Development; Centers for Disease Control and Prevention

Mother spreads awareness after multiple preeclampsia diagnoses

Mavis Stephens had the condition during three pregnancies

When Mavis Stephens became pregnant with her first child in 1995, she expected a healthy pregnancy. She was young and active and had no reason to think otherwise.

But during her fifth month of pregnancy, Mavis noticed some swelling and water retention. She mentioned it to her doctor, who advised her to rest more, keep her feet elevated, and reduce her salt intake. Swelling and water retention are common in pregnancy, the doctor said.

PERSONAL STORY

At the beginning of her third trimester, her swelling got worse. After taking her blood pressure at a prenatal visit, her doctor sent her to the hospital. Mavis was diagnosed with preeclampsia, a dangerous pregnancy complication that includes high blood pressure and signs of damage to another organ system, usually the liver and kidneys. She would need to stay at

the hospital until she delivered, her doctors said.

One week later, Mavis started leaking amniotic fluid and was transferred to a hospital that was better equipped to deliver a premature baby. Doctors discovered that Mavis had HELLP syndrome—a serious complication of high blood pressure during pregnancy. They rushed Mavis into the operating room for an emergency cesarean section. Her son was born at 28 weeks, and two days later, he died.

“I was devastated and packed all that pain away and went on with my life,” Mavis says. “My doctors assured me that I’d go on to have many kids because I was young.”

A second and third diagnosis

Two years later, Mavis was pregnant again. By the end of her second trimester, she was diagnosed with preeclampsia once again. Her doctor put her on bed rest.

“I was angry and frustrated and didn’t understand why my body



Mavis Stephens, who lost two babies to preeclampsia complications, speaks out about the condition to help other women.

Preeclampsia happens in **about 1 in 25 pregnancies** in the United States.

SOURCE: Centers for Disease Control and Prevention

was failing me,” she says. “I did everything I was supposed to do and found myself in that position again.”

At 38 weeks, Mavis delivered a healthy baby boy.

Mavis’ third pregnancy happened five years later in 2003. She was diagnosed with preeclampsia for a third time. During the fifth month,

Preeclampsia: What you need to know

High blood pressure, headache, blurred vision are symptoms

Preeclampsia is a pregnancy-related disorder in which **the mother's high blood pressure reduces the blood supply to the fetus**. This means the fetus may get less oxygen and fewer nutrients.

What causes it?

The causes of preeclampsia are unknown. Researchers including those at the National Institute of Child Health and Human Development are working to understand what causes the condition so it can be prevented and better treated.



What are the risks to the mother?

Women with preeclampsia are at increased risk for organ damage or failure, preterm birth, pregnancy loss, and stroke. Preeclampsia can develop into eclampsia, which is characterized by seizures and coma.



What are the risks to the fetus?

Risks include lack of oxygen and nutrients, preterm birth, and stillbirth. Infants born preterm due to preeclampsia are at higher risk of some long-term health issues mostly related to being born early. These include learning disorders, cerebral palsy, epilepsy, deafness, and blindness.



What are the symptoms?

Preeclampsia symptoms include high blood pressure, too much protein in the urine, and systemic problems such as headache, blurred vision, and upper abdominal pain on the right side. Women may also experience swelling in the face and hands.



What are the treatments?

For women at high risk, the U.S. Preventive Services Task Force recommends taking a low-dose aspirin starting after the first trimester to prevent preeclampsia. Delivering the fetus can help resolve preeclampsia, but symptoms can continue even after delivery. If the pregnancy is at less than 37 weeks, health care providers may consider treatments that give the fetus more time to develop. These include close monitoring, intravenous medication to control blood pressure, and steroid injections to help speed up the development of the fetus's lungs. ■



she gave birth to a stillborn baby girl. Doctors found Mavis was again suffering from HELLP syndrome.

"I went through all the phases of anger, sadness, numbness, and frustration. My son was 6 years old, and after nearly dying twice trying to have a baby, I knew I had to live for him."

"I felt like I had to be a voice for the women or babies who didn't survive preeclampsia."

– Mavis Stephens

Educating other women

Mavis says she wishes she knew about preeclampsia during her first pregnancy.

"You need to be your own advocate and be the squeaky wheel if you think something is wrong," she says. "No one talked to me about the symptoms of preeclampsia, which I later realized I had. There needs to be more awareness because this condition is quite common."

Preeclampsia affects between 2% and 8% of pregnancies.

Today, Mavis is on the advisory council for the Preeclampsia Foundation.

"I felt like I had to be a voice for the women or babies who didn't survive preeclampsia," she says. "This gives me the opportunity to have an impact and support women, and that's healing for me." ■

NIH research may help predict gestational diabetes earlier in pregnancy

Condition can have long-lasting effects on mom and child

Gestational diabetes is a disease that develops during pregnancy and affects how the body turns food into energy. In the U.S., about 6% to 9% of pregnant women develop gestational diabetes. Women who develop it are at increased risk for type 2 diabetes later in life.

“Minorities, particularly Asian or Hispanic women, are at much greater risk of gestational diabetes.”

– Cuilin Zhang, M.D., Ph.D.

Cuilin Zhang, M.D., Ph.D., is a clinical epidemiologist at the National Institute of Child Health and Human Development researching the genetic and environmental factors that cause gestational diabetes. She shares more about the disease’s lasting effects, its link to type 2 diabetes, and her research into prevention.

How did you become interested in studying gestational diabetes?

I was interested in gestational diabetes because it’s not just a pregnancy complication, but it can impact the fetus and the child. Children born from pregnancies complicated by gestational diabetes have an increased risk for cardiometabolic disorders, such as childhood obesity. After the

pregnancy, women, too, can have exceptionally high risk of developing type 2 diabetes and a greater risk of cardiovascular diseases.

I began my research on gestational diabetes with a particular focus on factors women can change that could prevent the disease. We have also researched potential biomarkers [which can help predict disease] you can change for early prediction of gestational diabetes and to better inform prevention and intervention.

Can you share some findings from your research?

Our research has looked at gestational diabetes before pregnancy, during pregnancy, and after pregnancy. We discovered that pre-pregnancy is a critical time for gestational diabetes risk. We identified a number of pre-pregnancy factors that can impact this risk, including smoking, a sedentary lifestyle, unhealthy eating, and a body mass index over 25. Not smoking, exercising for more than 150 minutes per week, eating a healthy diet, and maintaining a healthy weight prior to pregnancy was associated with an 83% lower risk of gestational diabetes.

Some of our current research is looking into how gestational diabetes can be predicted around week 10 instead of around week 28 based on omics research tools such as women’s metabolome profiles. This could allow us more time for prevention and intervention.

Postpartum, we have identified a number of healthful diet and lifestyle



Cuilin Zhang, M.D., Ph.D., researches gestational diabetes.

factors that can help reduce the risk of type 2 diabetes in women who have had gestational diabetes. Some of these include lactation [or breastfeeding] and following a low carbohydrate, high protein, and high fat diet mainly from plant-sourced foods.

What do you wish more people knew about gestational diabetes?

Some people don’t think that gestational diabetes is a severe disease because for a majority of women, their glucose levels go back to normal after pregnancy. Still, it can have this long-term and lasting impact on women’s health and on the offspring’s health. It’s important to think about the health impacts of gestational diabetes over their lifespan and the implications it can have on children.

What are your hopes about research in the future?

I hope that more research focuses on understanding the etiology, determinants, and health consequences of gestational diabetes in minority populations, as much of the research has been done among Caucasian populations. Minorities, particularly Asian or Hispanic women, are at much greater risk of gestational diabetes. ■

How to stay healthy during pregnancy

Healthy diet and exercise can reduce risk of complications

A healthy pregnancy is one of the best ways to promote a healthy birth. Early and regular prenatal care can help prevent complications and educate women about things they can do to have a healthy pregnancy. Here are a few areas to consider:

Prenatal care

Women who suspect they may be pregnant should schedule a visit to their health care provider to begin prenatal care. These visits usually include a physical exam, weight checks, and providing a urine sample. Health care providers may also perform blood tests and imaging tests, such as ultrasound exams. Prenatal visits also include discussions about the mother's health, the fetus's health, and any questions about the pregnancy.

Healthy diet and exercise

With regular prenatal care, women can reduce the risk of pregnancy complications. This is done in part through following a healthy diet, getting regular exercise as advised by a health care provider, maintaining a healthy weight, and avoiding potentially harmful substances, such as lead and radiation.



Women can reduce the risk of pregnancy complications by following a healthy diet.

Avoid alcohol and tobacco smoke

Women can also reduce the risk of complications to the fetus and infant. Tobacco smoke and alcohol, for example, may increase the risk of sudden infant death syndrome, or the unexplained death of an infant younger than 1 year old. Alcohol use increases the risk for fetal alcohol spectrum disorders, which can cause a variety of problems including birth defects and intellectual disabilities.

Prenatal vitamins

To promote a healthy pregnancy, the Centers for Disease Control and Prevention and the U.S. Preventive Services Task Force recommend taking daily prenatal vitamins that contain 400 micrograms of folic acid. The vitamin folic acid is shown to reduce the risk for birth defects of the brain, spine, or spinal cord by 70%. These defects, called neural tube defects, develop in the first month of pregnancy, often before a woman knows that she is pregnant. Prenatal vitamins contain other vitamins that pregnant women and their developing fetus need, too. ■

SOURCE: National Institute of Child Health and Human Development

Folic acid is shown to reduce the risk for birth defects of the brain, spine, or spinal cord by 70%.



The youngest patients, the toughest battles

Breakthroughs and complications in childhood cancer treatment



The survival rate for children diagnosed with cancer has risen from just 10% in the 1950s to nearly 85% today. That's one of the most striking examples of progress in modern medicine. Federally funded clinical trials, most of them conducted by the National Cancer Institute (NCI), have been especially important in developing new treatments for pediatric cancer. Though some types of childhood cancer are much more treatable today, others are still proving to be a challenge for researchers.

NIH MedlinePlus magazine spoke with two of NCI's top pediatric oncologists about some of the groundbreaking research achievements of the past decade for children's cancers. They also talked about some of the difficulties doctors still face in treating this disease in kids.

Brigitte C. Widemann, M.D., is chief of NCI's pediatric oncology branch. She helped develop the first medical therapy approved by the U.S. Food and Drug Administration (FDA) to treat tumors in children with neurofibromatosis type 1 (NF1). NF1 tumors are rare but occur more commonly in very young children with NF1.

Malcolm A. Smith, M.D., Ph.D., is the associate branch chief for pediatric oncology at NCI. He is an expert in cancer therapy evaluation. He is also a key NCI liaison to childhood cancer researchers across the country.

What are some of the most recent breakthroughs in childhood cancer treatment?

Dr. Widemann: The development of immunotherapy treatment for acute lymphocytic leukemia (ALL), the most common childhood cancer, is a major breakthrough. In 2017, a type of immunotherapy called CAR T-cell, which uses a strengthened version of the patient's own cells to fight the leukemia, was approved by the FDA for children. It's now one of the most effective treatments for ALL. We also have many clinical trials going on to target other cancers and solid tumors. We're very excited about it and hopeful for similar advances against other types of cancers.

15,000

About 15,000 children under age 20 are **diagnosed with cancer each year** in the United States.

SOURCE: Centers for Disease Control and Prevention



“Because pediatric cancers are relatively uncommon compared to adult cancers, we need to be able to collect and share data from all the individual centers nationwide that care for young people with cancer.”

– Malcolm Smith, M.D., Ph.D.

Dr. Smith: We also saw the first FDA-approved immunotherapy for children with high-risk neuroblastoma, a cancer that often presents widely disseminated throughout the body and that can be very difficult to treat. In 2015, based on findings from an NCI-sponsored clinical trial, the FDA approved the antibody therapy drug dinutuximab for high-risk neuroblastoma. The drug binds to a molecule on the surface of the neuroblastoma cells, causing an immune response that can kill the cells. In 2019, another NCI-supported trial showed that two back-to-back stem cell transplants are more beneficial for advanced neuroblastoma than just one. Children in the trial who received two transplants, followed by dinutuximab, lived substantially longer without their cancer progressing.

Childhood cancer survivors often face long-term health effects, including hearing loss, heart damage, impaired fertility, and a higher risk for a second cancer. What is being done to track survivors’ health and bring more attention to these effects?

Dr. Smith: The Childhood Cancer Survivor Study, which began in 1994 and is funded by NCI, follows more than 38,000 survivors diagnosed from the 1970s to the 1990s to identify late effects as a result of cancer treatment. The one thing we can do now as we learn more about these long-term effects is to research ways to change the up-front therapy, reducing the use of drugs that cause some of these problems. For example, we are using precision therapy or molecularly targeted therapies that may have fewer short- and long-term effects.

Dr. Widemann: Understanding what drives tumors has the potential to reduce some of the toxicity of chemotherapy. We are working on understanding the genetic makeup of specific tumors so that we can understand which ones may need less treatment. For example, a recent clinical trial had promising results using the tumor-inhibitor drug selumetinib instead of chemotherapy for children with a low-grade type of brain tumor called a glioma.

What is needed to encourage more research and development of treatment for pediatric cancers?

Dr. Widemann: Sharing of data from all cancer centers is important, especially for rare pediatric cancers. When only 30 or 40 children a year get a type of cancer, it’s important that we can quickly collect data from each of those cases to do research and get a better understanding of the disease and determine what treatment will be effective and safe.



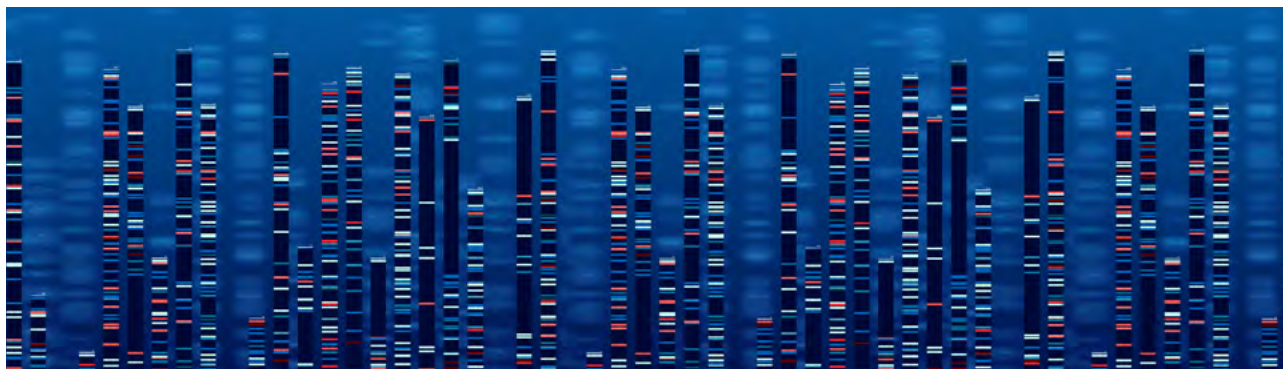
“Sharing of data from all cancer centers is important, especially for rare pediatric cancers.”

– Brigitte Widemann, M.D.

Dr. Smith: Because pediatric cancers are relatively uncommon compared to adult cancers, we need to be able to collect and share data from all the individual centers nationwide that care for young people with cancer. That’s why NCI recently created the Childhood Cancer Data Initiative. Our goals include gathering data from every child, adolescent, and young adult diagnosed with a pediatric cancer, regardless of where they receive care, and creating a national strategy to speed diagnosis and guide treatment for all types of pediatric cancer. ■

New treatments possible for a rare childhood cancer

Findings from study may help target gene mutations and improve therapies



Researchers found mutations in several genes that seem to be connected to a more aggressive form of rhabdomyosarcoma (RMS) and a lower chance of survival.

Thanks to new research, children with the rare childhood cancer rhabdomyosarcoma, or RMS, may be able to receive more targeted treatment.

Childhood RMS is a cancer of the soft tissue, like muscles and tendons. It accounts for about 3% of all pediatric cancers. Most cases of RMS are diagnosed in children and teens, with more than half in children under 10.

Scientists from the National Cancer Institute (NCI) and the Institute of Cancer Research in London looked at the DNA of tumors from 641 children with RMS. They were enrolled in several clinical trials over 20 years.

Most cases of RMS are diagnosed in children and teens, with **more than half in children under 10.**

SOURCE: National Cancer Institute

“If we can predict who’s going to do well and who’s not, then we can really start to tailor our therapies.”

– Jack Shern, M.D.

The scientists searched for genetic mutations that could help predict how well children with RMS would respond to treatment. They found mutations in several genes that seem to be connected to a more aggressive form of the disease and a lower chance of survival.

“These discoveries change what we do with these patients. They trigger a lot of really important research into developing new therapies that target these mutations,” said Javed Khan, M.D., of NCI’s Genetics Branch, who led the study.

The standard therapy for RMS involves a year of chemotherapy, radiation therapy, and surgery. That means children with this cancer get

a lot of toxic treatments, said study co-author Jack Shern, M.D., of NCI’s Pediatric Oncology Branch.

“If we can predict who’s going to do well and who’s not, then we can really start to tailor our therapies or eliminate therapies that aren’t going to be effective in a particular patient,” Dr. Shern said. “For the children who aren’t going to do well, this allows us to think about new ways to treat them.”

Routine tumor genetic testing is a standard part of the treatment plan for more common cancers, such as breast cancer. The researchers hope that will soon be true for rare cancers such as RMS. ■

4 unique challenges of childhood cancer research

Cases make up 1% of all new cancer diagnoses in U.S.

Treatments for several types of childhood cancer have improved over the past decades. For other types, progress has been limited. And many survivors of childhood cancer may experience long-term effects from the disease or its treatment.

That's why more research is needed to develop more effective, safer treatments for pediatric cancers. But researchers in this area face these unique challenges:

1) Childhood cancers make up less than 1% of all new cases of cancer diagnosed in the U.S. Because of this, it's hard to enroll enough people in treatment clinical trials and to get meaningful results from those trials.

2) The causes of most childhood cancers are unknown. Only a small percentage can be linked to genetics or environmental exposure.

3) Children's cancers are different from adult cancers. For example, tumors that can develop in children's organs and tissues rarely occur in adults.

4) There are distinct challenges in developing new treatments for kids. Special rules help protect children participating in research, and the effects of new treatments on kids' development have to be considered. ■

SOURCE: National Cancer Institute

Childhood cancer: By the numbers

84% of children will survive five years post-diagnosis



Survival rates for most childhood cancers have improved in recent decades and improvement has been especially dramatic for a few types from 1975 to 2012:

92% For **acute lymphoblastic leukemia**, the most common childhood cancer, the **five-year survival rate** rose from 57% to 92%.

91% For **non-Hodgkin lymphoma**, the **five-year survival rate** increased from 43% to 91%.

Some other key stats include:

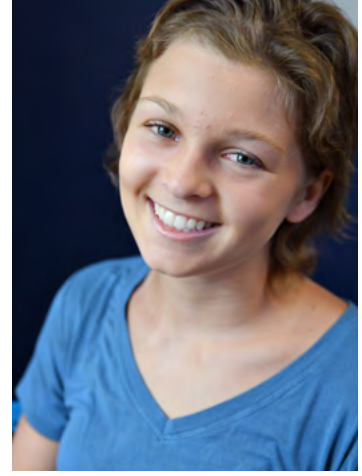
10.5k Estimated number of children under the age of 15 who will be **diagnosed with cancer in 2021**.

84% The percentage of children diagnosed with cancer who will **survive at least five years**.

5.1 The number of **cancer deaths** for people under 20 was **5.1 per 100,000 children in 1975**.

2.2 The number of **cancer deaths** for people under 20 was **2.2 per 100,000 children in 2017**.

SOURCE: National Cancer Institute



NIH's "The Children's Inn" gives families hope for more than 30 years

A place like home for children with rare diseases

For children and young adults with rare diseases, The Children's Inn on the National Institutes of Health (NIH) campus in Bethesda, Maryland, is a place like home. It's a place where they can feel accepted and safe. Staff and other patients understand their long, difficult health struggles.

The Inn provides free housing for the families of young people who are participating in NIH clinical trials and groundbreaking research on rare and little-understood diseases. For these families, coming to NIH is often the only hope for treating their child's condition.

While NIH takes care of patients' medical needs, it's the Inn that tends to their social and emotional needs. "NIH and The Children's Inn have given me reasons to be happy, to feel alive. It brings so much hope and happiness to us kids," one young patient said in a video celebrating the Inn's 30th anniversary.

"NIH and The Children's Inn have given me reasons to be happy, to feel alive."

– Patient

The Inn offers residents therapeutic, recreational, and educational programs and services. It also has an emergency fund for families experiencing tough times.

Another fund helps families pay for therapeutic or academic activities once they return home.

Since 1990, the Inn has served more than 14,500 children, teens, and young adults and their families, from all 50 states and 105 countries. These seriously ill young people have participated in more than 500 clinical studies. The studies involve cancer, bone and growth disorders, mental illness, genetic conditions, and other serious health issues.

When the Inn opened, it had 37 rooms for families. In 2004, a new wing added rooms for 22 more families. It also included another kitchen and more spaces for residents to mingle and enjoy activities. In June 2021, NIH announced a multiyear plan to renovate and expand the Inn. ■

A clinical trial and your caring heart mean everything to Terran and her family

Article courtesy of *The Children's Inn at NIH*

When Terran, 14, passed out in school, an ambulance took her to the hospital. Scans revealed two large blood clots in her lungs and a large tumor in her abdomen.

Her diagnosis of mesothelioma came as a shock—not just because the cancer is rare but because it typically affects older adults, mostly men, who have been exposed to asbestos. The prognosis for mesothelioma is dire, and few places specialize in treating children with the disease.

“There are very few words that can explain how important The Children’s Inn is to my patients.”

– Rosandra Kaplan, M.D.

“Mesothelioma in pediatrics is very rare,” says Rosandra Kaplan, M.D., an investigator at the NCI Center for Cancer Research’s Pediatric Oncology Branch and head of the Tumor Microenvironment Section. “It requires a lot of expertise, and the expertise is very limited in the places in the world that do this. And the NIH is one of the places, and that’s why she came here.”

Although Terran’s surgery successfully removed her tumor, some of her lymph nodes and areas near her liver showed additional cancer cells. Terran’s best chance to beat her rare cancer was a newly opening trial.

“I was only 15 years old at the time,” she recalls. “I was still going to school. I guess the fact that it could work made me want to do it more.” Terran became the first patient to try a medication called pexidartinib for her type of cancer. The results have been astounding.

“Terran is amazing, and she is doing very well,” Dr. Kaplan says. “There is a lot of uncertainty still. Her response to the trial has been remarkable.”

Besides getting the most advanced care for her rare cancer at NIH, Terran is excited that her clinical trial participation means she’ll be paving the way for other young people to benefit from the same treatment in the future.

Thanks to her successful treatment, Terran today is a sophomore at Morris College in Sumter, South Carolina, majoring in communications. She returns regularly to the NIH and The Children’s Inn for checkups, accompanied by her father, Terrence.

While father and daughter have always been close, cancer has brought them even closer. When Terrence also was diagnosed with cancer a couple of years ago, he chose to join an NCI clinical trial for his treatment as well.

“I was so impressed by the care that Terran got at NCI, so I knew that is what I wanted to do too,” he says.

Because you care, the Inn has been able to provide Terran and her family with a comfortable, nurturing place like home. Over the past six years, Terran and her family have come to The Children’s Inn regularly for



Terrence and Terran both received treatment at The Children’s Inn.

checkups at NIH. Since Terrence’s cancer diagnosis, father and daughter have been scheduling their follow-up appointments at the same time, so they can spend time together at The Children’s Inn.

“There are very few words that can explain how important The Children’s Inn is to my patients,” Dr. Kaplan says.

“I can just go up to the front desk and be like, ‘Hi, what’s up?’ and then we’ll just have this full-on conversation about anything,” Terran says joyfully. “The Children’s Inn and its energy—you honestly cannot help but fall in love with it.”

“I would like to say thanks to everyone here at The Children’s Inn, from Miss Jennie, the CEO of The Children’s Inn, all the way down to the cleaning crew,” Terrence says. “We want to say, ‘Thank you’ for everything you do.”

“We’re grateful she [Terran] is still with us to this day,” Terrence adds.

Thank you for being there for Terran and her family, and thousands of children and families like them! ■

from
the

lab

LATEST
RESEARCH
UPDATES
FROM NIH

Childhood sleep apnea linked to high blood pressure in teens

CHILDREN WITH SLEEP APNEA have an increased risk of developing high blood pressure in their teens, a new study has found. High blood pressure is a major risk factor for heart disease.

Sleep apnea is a common disorder that causes people to briefly stop breathing during sleep. It typically happens multiple times during a single night's sleep. While it mostly affects adults, about 10% of school-age children also suffer from sleep apnea. Nearly half of these children will outgrow the disorder. The other half must deal with a potentially chronic and progressive health problem.

The researchers, supported by the National Institutes of Health, began by testing several hundred children aged 5 to 12 for sleep apnea. A small proportion of those tested were diagnosed with the disorder. Eight years later, the researchers evaluated all the children again. They were tested for both sleep apnea and high blood pressure. The results showed that children who continued to have sleep apnea in their teens were nearly three times more likely to develop high blood pressure than children who never had sleep apnea. Children who were initially diagnosed with sleep apnea but had few or no symptoms by the time they became teens did not show an increased risk of high blood pressure.



Sleep apnea reduces the quality of sleep at night, causing daytime drowsiness.

Several studies have looked at the link between sleep apnea and high blood pressure in adults. But few have checked the risk of high blood pressure in children with the disorder.

Like adult sleep apnea, childhood sleep apnea can be treated. Treatment may include surgical removal of tonsils and adenoids.

Some children may be helped by using a CPAP machine, which delivers air through a mask to keep the airway open during sleep. For children who are overweight, adopting a healthy eating and exercise plan can also help. ■

SOURCE: National Heart, Lung, and Blood Institute



Could eating fish help your migraines?

A DIET HIGH IN FISH FATS and low in vegetable oils may help reduce the number and severity of migraines, according to a new study from the National Institutes of Health.

Migraines are one of the most common causes of chronic pain and reduced quality of life. Many people who get migraines can't work or function normally during an attack. Attacks can last from four hours to as long as three days. Current medicines for migraines may only provide partial relief. They can also have negative side effects.

This study offers a promising alternative. Researchers expanded on earlier work on the impacts of linoleic acid and omega-3 fatty acids on chronic pain. Linoleic acid is a primary source of fat in the American diet. It's found in vegetable oils, nuts, and seeds. Omega-3 fatty acids are mostly found in fish and shellfish.

Over the course of 16 weeks, participants with frequent migraines were assigned one of three healthy diet plans. One group received meals low in linoleic acid (vegetable oils) and high in fatty fish. A second group received meals high in both linoleic acid and fatty fish. A third group received meals high in linoleic acid and low in fatty fish. This third meal plan was designed to be similar to the typical American diet.

At the end of the study period, participants on the diet low in linoleic acid and high in fatty fish had 30% to 40% reductions in headache hours per day, severe headache hours per day, and number of headache days per month, compared with those on the American-style diet.

The study showed that changes in diet might offer real relief to the millions of Americans who suffer from migraine pain, without the downsides of often-prescribed migraine medicines. ■

SOURCE: National Institute on Aging

Why short breaks help you learn

TAKING SHORT BREAKS can be just as important as practice in helping you master a new skill, according to a recent study from the National Institutes of Health (NIH). The study showed that short rest periods were key to improving performance of a new task. But it wasn't clear how these rest periods helped the brain learn better.

In a new study from NIH, a research team set out to find the answer. They mapped the brain activity of right-handed participants as they learned to type a five-digit code with their left hands. After the participants viewed the code on a screen, they were asked to type it as many times as possible for 10 seconds. Then, they took a 10-second break. They repeated this activity 35 times.

The team used a computer program to decipher brain activity while the participants typed and when they were at rest. The researchers found that participants whose brains replayed the typing activity more often performed better on the typing task, compared with those who had fewer replays.

"Our results support the idea that wakeful rest plays just as important a role as practice in learning a new skill," said research leader Leonardo Cohen, M.D. Understanding how the brain does this may not only be helpful for learning new skills, it may also help people recover skills lost after a brain injury, such as a stroke. ■

SOURCE: National Institute of Neurological Disorders and Stroke



Practice makes perfect—along with brief rests in between, according to new research.

NIH on the web



From patients to celebrities, find it on NIH's YouTube channel

➔➔ **FIND HUNDREDS OF VIDEOS** featuring everyone from the National Institutes of Health (NIH)'s COVID-19 researcher Kizzmekia S. Corbett, Ph.D., to actress Julia Roberts on [the National Institutes of Health YouTube channel](#).

In addition to interviews, the channel's video archives offer insight into the research that makes new treatments and cures. Learn how artificial heart valves work, tips for controlling chronic pain, and how to end stigma around addiction and substance abuse.

The channel also has the latest videos on the COVID-19 pandemic and how NIH research is responding to it.

Learn about pelvic floor disorder treatments

➔➔ **WHAT ARE PELVIC FLOOR DISORDERS** (PFDs) and how can you manage them? A [new infographic](#) from the National Institute of Child Health and Human Development has tips that can help.

PFDs affect women's pelvic organs, including the uterus, vagina, and bladder. When the muscles that surround and support these organs are weak, leaks can occur when you cough, sneeze, or exert yourself. This can cause discomfort in the bladder or bowel area, as well as self-consciousness. Nearly a quarter of U.S. women may be affected by PFDs. The risk of developing a PFD can increase with age and the number of times a woman gives birth.

The infographic explains surgical and nonsurgical treatments for PFDs. Nonsurgical treatments can include maintaining a healthy weight, not smoking, and doing exercises that strengthen pelvic floor muscles.



Yoga bridge pose works the pelvic floor muscles.

Find it all in one place!
magazine.medlineplus.gov/otw



Test your knowledge about supplement interactions

➔➔ **DO YOU KNOW** how your medications may interact with over-the-counter supplements? Find out by taking an informative, [interactive quiz](#) from the National Center for Complementary and Integrative Health.

The quiz offers tips on how to read supplement labels on things like vitamins and other products. For instance, if you take a prescription drug and a supplement like St. John's wort or concentrated green tea, you could reduce or increase the amount of the drug in your body, potentially making your medicine less effective or even causing harm. The quiz also gives advice about how supplements could interact with a surgical procedure.

It's important to discuss all the medicines and supplements you take with each one of your health care providers. That's because different doctors may prescribe different medications.

NIH is here to help

The National Institutes of Health (NIH)—the nation’s medical research agency—includes 27 Institutes and Centers and is a part of the U.S. Department of Health and Human Services. It is the primary federal agency for conducting and supporting basic, clinical, and translational medical research, and it investigates the causes, treatments, and cures for both common and rare diseases. For more information about NIH and its programs, visit www.nih.gov.

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www.genome.gov

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www.nia.nih.gov

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www.nibib.nih.gov

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www.nichd.nih.gov

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[National Institute on Deafness and Other Communication Disorders \(NIDCD\)](#)

www.nidcd.nih.gov

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800-241-1055 (TTY)

[National Institute of Dental and Craniofacial Research \(NIDCR\)](#)

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www.niddk.nih.gov

NIDDK Health Information Center

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www.nih.gov/institutes-nih/nih-office-director/office-communications-public-liaison

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[Office of Rare Diseases Research \(ORDR\)](#)

www.rarediseases.info.nih.gov

Genetic and Rare Disease

Information Center

888-205-2311

[Office of Research on Women’s Health \(ORWH\)](#)

orwh.od.nih.gov

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Providers and patients of all sizes can work together to ensure respectful care that promotes a healthy pregnancy, birth, and baby.

Learn how at:
nichd.nih.gov/Pregnancy4EveryBody



NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development

NATIONAL CHILD & MATERNAL HEALTH EDUCATION PROGRAM

