

NIH News in Health

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Pregnancy Problems? Boost the Chance of Having a Baby

For those who dream of being parents, pregnancy problems can be tremendously frustrating and disappointing. In recent decades, scientists have developed a wide range of approaches to help struggling couples have healthy babies. And NIH-funded studies are continuing to search for even better ways to overcome the challenges of **infertility**.

Infertility is a fairly common condition. It affects about 1 in 10 couples who are trying to have a baby. Infertility can be traced to the man in about a third of these cases and to the woman in another third. The rest of the time, the difficulties lie with both partners or no cause can be found.

"Although there are many known causes of infertility, there are still some cases of fertility impairments that we don't understand," says NIH's Dr. Louis V. DePaolo, an expert in fertility research. "We're constantly discovering new molecules that are vital to the fertility-regulating process." By learning more about these molecules and other factors, scientists hope to find new and improved ways to prevent or treat infertility.



Definitions

Infertility

Unable to get pregnant after a year of trying or after 6 months if a woman is age 35 or older.

Hormone

Substance made by the body to affect how the body grows and functions.

Knowing the underlying causes of infertility is important because it can help couples choose the best therapy. "Since there are many causes, a treatment that works for one person might not be the best choice for another," DePaolo says. The most common treatments today are surgery or medication.

Fertility troubles can arise in any of the steps needed for a successful pregnancy. To get pregnant, a woman's body must first release an egg from one of her ovaries, a process called ovulation. The man's sperm then has to join with, or "fertilize," the egg. The egg must then travel through a passageway known as the fallopian tube and head toward the woman's uterus (womb). The fertilized egg must then attach to the inside of the uterus (implantation).

Infertility can be related to a man if there are problems with the number, shape, or movement of sperm. These glitches can make it hard for the sperm to fertilize the egg. About 1 in 5 infertile men have sperm troubles because of a **hormone** imbalance, which can sometimes be corrected with medication.

"Another common identifiable cause of male infertility occurs when a man has large veins around the testicle, which makes the whole scrotum warmer than it should be. The heat decreases the production and quality of sperm," says Dr. Peter N. Schlegel, who specializes in



treating male infertility at Cornell University. This condition, called varicoceles, is usually harmless, but it can be corrected with surgery if it's causing infertility. Surgery can also help to remove blockages that prevent sperm release.

"There are also genetic causes of low sperm production, which are probably more common than we can identify, because we don't yet understand all the causes of male infertility," Schlegel says.

For women, the most common cause of infertility has to do with ovulation problems, which affect about 40% of women who have pregnancy trouble. "Ovulatory problems occur

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when a woman ovulates irregularly or not at all," says Dr. Linda Giudice, a reproductive health expert at the University of California, San Francisco. "Causes can include stress-related lack of or irregular periods, polycystic ovary syndrome (PCOS), advanced



Wise Choices What Raises Your Risk for Infertility?

Both men and women:

- Excess alcohol use
- Smoking
- Older age

Men:

- Environmental toxins, including pesticides and lead
- Health issues such as diabetes, hormone problems, or kidney disease
- Certain medicines
- Radiation treatment and chemotherapy for cancer

Women:

- Stress
- Poor diet
- Being over- or under-weight
- Sexually transmitted infections
- Health problems that cause hormonal changes, such as polycystic ovary syndrome or primary ovarian insufficiency

Adapted from U.S. Office on Women's Health

maternal age, and a variety of other possible factors, like hormone issues that can interrupt normal ovulation."

Other common causes of female infertility include blocked fallopian tubes or conditions that affect the health of the egg or its implantation after fertilization.

In the United States, older maternal age is a growing contributor to fertility problems. About 1 in 5 women nationwide now have their first child after age 35. Once a woman reaches this age, fertility complications arise in about 1 of every 3 couples trying to have a baby. Studies suggest that after age 30, a woman's chances of getting pregnant decrease every year, especially after age 37.

"One of the biggest challenges in infertility treatment is related to advanced maternal age, when the egg quality and egg numbers decrease," Giudice says. "For older women, treatment can usually help to achieve ovulation, but the problem usually lies in not having good-quality eggs."

Aging not only reduces the likelihood of having a baby. It also raises the chances of miscarriage or having a child with certain health problems. High-risk pregnancies are also more likely as women get older.

In some cases, infertility can be corrected through lifestyle changes, such as losing weight or stopping tobacco use. If this doesn't work, doctors may recommend medication, surgery, artificial insemination (in which a woman is injected with specially prepared sperm), or assisted reproductive technology, which is usually the most expensive and



Web Links

To learn more about infertility, click the "Links" tab at:
<http://newsinhealth.nih.gov/issue/Jul2015/Feature1>

complex option. Assisted reproductive technology includes different methods for fertilizing eggs, usually outside of the body.

Giudice and her colleagues are among many NIH-supported scientists studying the pregnancy process. "We're examining what happens during certain stages of egg development, what happens when women are of advanced maternal age or when they have a condition called endometriosis, which affects egg quality and the lining of the uterus and its receptiveness to implantation," Giudice says.

Schlegel and his coworkers are among those focusing on the underlying causes of male infertility. "We're looking at factors called micro-RNAs, which are small bits of genetic material that are made by the body to help regulate how a wide variety of body parts work, including the areas of the testicle involved in sperm production," Schlegel says. "We're also looking at other genetic causes of infertility and ways to improve or create sperm for men who can't make them."

For couples who have tried to have a baby without success, experts recommend seeking medical help after at least a year of trying if the woman is younger than 35, or after 6 months if the woman is age 35 or older. It's also a good idea for couples to talk with a health care provider before even trying to get pregnant.

"If you're planning to start a family, your health before you begin trying is very important," DePaolo says. "By being healthy, you have a better chance of being able to conceive within a

normal amount of time, and you're more likely to have healthy offspring as well." ■

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National Institutes of Health

Office of Communications
& Public Liaison

Building 31, Room 5B64

Bethesda, MD 20892-2094

[nihnewsinhealth@od.nih.gov](mailto:.nihnewsinhealth@od.nih.gov)

Tel: 301-402-7337

newsinhealth.nih.gov

Editor Harrison Wein, Ph.D.

Managing Editor Vicki Contie

Contributors Stephanie Clipper, Vicki Contie, Alan Defibaugh (illustrations), Brandon Levy, Samantha Watters, and Harrison Wein

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Minding Your Metabolism

Can You Avoid Middle-Age Spread?

As you age, you may notice you have less muscle and energy and more fat. Carrying those extra pounds may be harming your health. It's easy to be confused by advice about diet and exercise, but they're key to avoiding weight gain as you get older. As you move through your 30s, 40s, 50s, and beyond, you can take steps to help fight the flab that can come with age.

Your **metabolism** changes as you get older. You burn fewer calories and break down foods differently. You also lose lean muscle. Unless you exercise more and adjust your diet, the pounds can add up. Middle-age spread can quickly become middle-age sprawl.

"At some point, everyone loses muscle mass as they get older and gains abdominal fat," says NIH's Dr. Mark Mattson, an expert on aging and exercise. The so-called couch-potato lifestyle is the main culprit behind middle-age spread. "Over-eating and leading a **sedentary** lifestyle can speed up age-related changes in metabolism," Mattson says.

One key player in age-related changes is a chemical called leptin, which helps your brain tell you to stop eating. Leptin signals don't

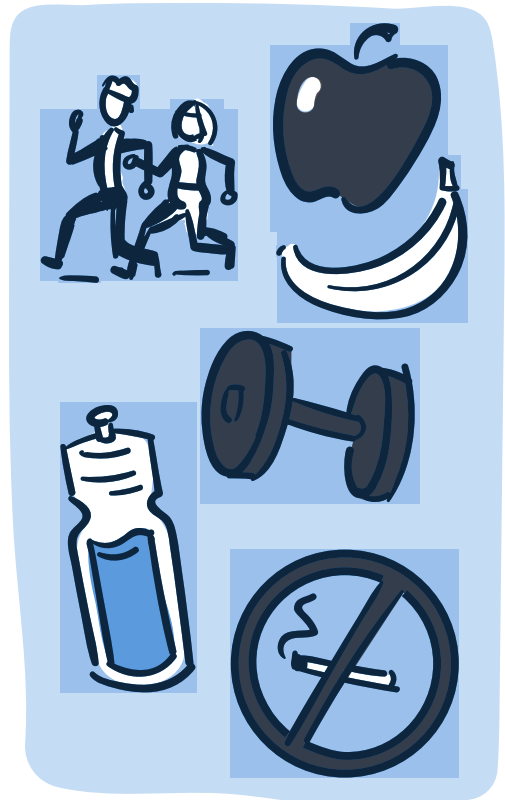
work as well as you get older, so you might continue to feel hungry even after you've eaten. Obesity makes leptin even less effective.

"There's a reward part to everything you eat," says Dr. Josephine M. Egan, an NIH expert on diabetes and aging. "You get the taste of the food. You feel good. Normal-weight people will satisfy cravings by having a small amount of what they crave." As both the years and the pounds add up, however, you may need to eat more of what you crave to get the same pleasant sensation.

Both aging and obesity can also bring changes to the way your body processes glucose—the sugar your body makes from food and uses for energy. These changes can lead to diabetes, which raises your risk for heart disease, blindness, amputations, and other conditions.

"Obesity increases the risk, and reduces the age of onset, for many diseases of aging," Mattson says. "Over the long-term, even our brains are affected. Emerging evidence suggests that long-standing diabetes and obesity can lead to changes in brain cells that make them vulnerable to aging."

As you move beyond your 50s, you'll probably need fewer calories. But it's also important to maintain proper nutrition, so don't skimp on healthy foods. Weighing too little and weighing too much are each linked to poor health, especially in older people. For tips about healthy eating



after age 50, visit www.nia.nih.gov/health/publication/whats-your-plate.

Exercise and moving are also important. "It doesn't matter what your age is; physical activity is good for you," says Egan. Be sure to talk with your health care provider about safe ways to adjust your activity patterns as you get older. If you have a specific health issue that you're concerned about—such as arthritis or a recent surgery—ask for tips to help you exercise safely. Work together to choose activities that are best for you.

Focusing on physical activity and healthy eating are the keys to avoiding middle-age spread and the health problems that can come with it. NIH's Go4Life exercise and physical activity campaign is designed especially for older adults. For tips to help you get started, make a plan, set goals, and more, visit <https://go4life.nia.nih.gov/>. ■



Wise Choices Small Steps to Healthy Aging

- Commit to a healthy diet.
- Limit snacking.
- Drink plenty of water.
- Move more. Take the stairs and add walking breaks to your day.
- Get plenty of sleep.
- Limit alcohol use. Alcohol is high in calories and may worsen health conditions common among older adults.
- Avoid tobacco products.



Definitions

Metabolism

Chemical changes in the body that create the energy and substances you need to grow, move, and stay healthy.

Sedentary

Sitting or lying down while you're awake.



Web Links

For more about metabolism and aging, click the "Links" tab at: <http://newsinhealth.nih.gov/issue/Jul2015/Feature2>



Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/Jul2015/Capsule1>

Milk Gland “Remembers” Past Pregnancy

A team of NIH-funded scientists found that an animal's first pregnancy can lead to lasting changes in how **genes** are turned on and off in the milk-making mammary gland. The finding may help explain why humans and other mammals make more milk faster during second pregnancies.

Scientists have long been puzzled by the boost in milk production seen in second pregnancies. The mammary gland's structure doesn't change after pregnancy, so there must be

another reason why this occurs.

To investigate, researchers gave pregnancy hormones to female mice. As expected, the mammary glands in mice that had been pregnant before grew more quickly and produced milk sooner than those of mice that had never before been pregnant.

Next, the team looked at how pregnancy affects a chemical tag that can attach to the DNA in cells. These tags are part of the so-called “epigenome.” They change how DNA is read (whether genes are turned off or on) but don't alter the DNA sequence itself. These changes, then, affect how the body makes proteins.

In mice that had been pregnant or given pregnancy hormones, many stretches of DNA in the mammary gland had fewer of these epigenetic tags. These changes lasted for several months. They altered how the DNA

was read, but only when the mice were given pregnancy hormones, suggesting that the tags only have an effect during pregnancy.

“This is an example of epigenetic memory,” says study coauthor Dr. Camila dos Santos of the Cold Spring Harbor Laboratory in New York. In other words, the changes to the mammary gland's epigenome allowed it to “remember” that the animal was pregnant before.

The researchers are now looking at whether epigenetic changes might also explain why pregnancy reduces breast cancer risk later in life. ■



Definitions

Genes

Stretches of DNA, a substance you inherit from your parents, that define features such as your risk for certain diseases.

Protect Your Skin from Sun Damage

The sun helps your skin make vitamin D to keep your bones healthy. The sun can also help improve your mood and keep your sleep schedule regular. But too much sun can lead to sunburns and other damage that you can't see. A new video from NIH—*So Far and Yet So Close: The Sun and Your Skin*—can help you learn how to avoid the sun's harmful effects.

It's not the sunlight you see that damages your skin. The sun also makes UV or ultraviolet light, which the human eye can't detect. Some UV rays go deep into the skin and cause

damage. If you get too much sun, your skin may have trouble repairing itself, which can make skin look older. Eventually, too much sun exposure can lead to skin cancer, the most common type of cancer in the U.S.

The best way to avoid sun damage is to limit your time in direct sunlight. Get more tips for protecting your skin by watching the video on the NIH YouTube channel at www.youtube.com/watch?v=yZpEvX20gm4. Or read *NIH News in Health's* “Sun and Skin” article at <http://newsinhealth.nih.gov/issue/jul2014/feature1>. ■



Featured Website Alcohol Calculators

<http://rethinkingdrinking.niaaa.nih.gov/ToolsResources/CalculatorsMain.asp>

So what's in that drink, exactly? Summer cocktails may be stronger, more caloric, and more expensive than you realize. NIH's alcohol calculators can help you assess calories, drink size, alcohol spending, blood alcohol levels, and the number of standard drinks in each cocktail.

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