


NIH MedlinePlus®

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Institutes of Health

WINTER 2013

the magazine



Understanding ASD
**Autism
Spectrum
Disorders**

Football legend and broadcaster

Dan Marino

*Helping those with
autism spectrum disorders
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*Claire and Dan Marino
with son Michael*

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FNLM 2013 Events & Programs Announced

During 2013, the Friends will continue and expand programs that promote medical education and health literacy in several related areas.

Professional Education

In Spring 2013 (date TBA), a workshop on the value of clinical trials in improving patient care will be co-sponsored by the Institute of Medicine (IOM), American Association for the Advancement of Science (AAAS), NLM, and FNLM. The workshop is planned for the Lister Hill Center auditorium at NIH. FNLM anticipates having an audience of more than 50 leaders from the pharmaceutical industry, health, and academic sectors.

Minority Outreach Program through NLM

Mentoring in Medicine (MIM) is an NLM-FNLM outreach effort that supports a unique program for inner-city high school students. Participants are enrolled in after-school



▲ At a Mentoring in Medicine (MIM) event, a possible future medical professional gets the chance to model a lab coat with a MIM mentor.

Photo: Mentoring in Medicine.

courses and use their elective course time to take part in activities that help develop their awareness of and interest in healthcare career opportunities. MIM is expanding the program from New York City to Washington D.C.

Over a four-year period MIM has held over 60 classes on the exploration of anatomy and physiology organ systems, along with their associated health conditions. These are then followed by career-oriented sessions presented by medical and ancillary healthcare professionals focused on courses of study in their field of expertise.

Annual Awards Dinner

In 2013, the Awards Dinner to celebrate advances in public health, medicine, and health communication will be held on Tuesday, September 17. The venue will once again be at the Rooftop Garden of 101 Constitution Avenue in Washington.

Congressional and Public Outreach

2013 will also see the revival of FNLM's outreach to Congress and the public through educational sessions to be held on Capitol Hill. More details coming soon.

Help Out for Health: Be a Friend

Be part of the Friends' mission to help educate the public and the health and corporate communities about NIH's many vital research initiatives.

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Director, NLM

Betsy L. Humphreys, M.L.S., A.H.I.P.
Deputy Director, NLM

Kathleen Cravedi
Director, Office of Communications
and Public Liaison, NLM

Naomi Miller, M.L.S.
Manager of Consumer Health Information, NLM

Patricia Carson
Special Assistant to the Director, NLM

Elliot Siegel, Ph.D.
Outreach Consultant, NLM

Christopher Klose
Contributing Editor

Peter Reinecke
Strategic Advisor



Friends of the NLM
(202) 679-9930

7900 Wisconsin Avenue, Suite 200,
Bethesda, MD 20814

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William G. Moore, President
Sharon B. Tesh, Senior Staff Accountant

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This Vscan handheld ultrasound imaging device—using NIH-funded technology—is helping health professionals see into the body.

Photos:

(Cover & Middle) The Dan Marino Foundation
(Top) Dusty Donaldson
(Bottom) General Electric Healthcare

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The National Institutes of Health (NIH)—the Nation's Medical Research Agency—includes 27 Institutes and Centers and is a component 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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NIH Research:

A Q&A with Harold Varmus, M.D.,
Director, National Cancer Institute (NCI)

Fighting Cancers: Continuing Crucial Research on a “Constellation” of Diseases

Harold Varmus, M.D., is co-winner of a Nobel Prize for studies of the genetic basis of cancer. Among his leadership positions, he has served as President and Chief Executive Officer of Memorial Sloan-Kettering Cancer Center and Director of the National Institutes of Health (NIH) from 1993 to 1999. Dr. Varmus received early training in genetics and molecular biology at the National Cancer Institute (NCI) in the late 1960s. He has been Director of the NCI since July 2010. The year 2013 marks the 76th anniversary of the founding of the NCI—the world’s largest organization solely dedicated to cancer research.

Photo: National Cancer Institute



What would you say has been the biggest change in our understanding of cancer during the past few decades?

In the last 40 years—the period of time in which I’ve been doing cancer research—we’ve come a long way. We’ve gone from really knowing nothing about how a normal cell became a cancer cell to being able to describe that process in exquisite genetic and molecular detail.

This transformation has been accompanied by gradual—and occasionally dramatic—improvements

in the control of human cancer. In an increasing number of cancers, new concepts about the biology of cancer are driving changes in the ways we prevent, diagnose, and treat disease.

How does that new understanding affect how we think about cancer and cancer research?

What we’ve learned can be grouped into three categories. First, we’ve learned that cancer is not simply a single disease that affects many parts of the body. It is not, for example, a “war on cancer” as

a single enemy. It is many different diseases with common themes that can cause different kinds of disorders in many of our organs. These include mutations in many different genes, changes in essential cell functions, and unusual interactions with the cellular environment in which tumors grow. We need to study each of these areas separately.

Second, because we use so many methods to approach the disease, virtually every part of the scientific community is working to try to understand cancer and control it

better. They are studying approaches to prevention, multiple methods to screen for early stages of cancer growth, more precise diagnostic tests, and better therapies.

And third, we've made progress using a variety of new techniques and science of many kinds. Progress in the control of cancer has required new knowledge from the many fields of research that the NCI supports.

As we begin 2013, what are some of the opportunities that you see in cancer research?

The National Cancer Institute is ready to take advantage of new and emerging scientific opportunities in cancer research. We can do this because we now understand that cancers are diseases caused by changes in a cell's genome—all of the biological information needed to build and maintain a living organism.

We also have new tools for understanding cells at a molecular level. There are now new technologies for genomic analysis.

Progress in molecular biology has transformed our ability to understand the broken parts of a cancer cell. It also allows us to develop new and more precise therapeutic strategies.

In just the past few years, NCI-supported science has delivered a remarkable collection of genetic information about several types of cancers, a number of new targeted therapies for various cancers, compelling examples of success-

ful therapies, persuasive evidence that radiographic screening can identify lung cancer early enough to reduce lung cancer mortality, and many new observations about how cancer cells arise, develop, behave, and interact in their micro-environment.

How has the work of NCI changed since the National Cancer Act was signed just over 40 years ago?

When the National Cancer Act was signed in 1971, the NCI Director was viewed as the leader of the National Cancer Program, heading the nation's efforts to combat cancer. We now recognize that efforts to control cancer and its effects—through science, medicine, and social programs—are so vast, conducted by so many people, and funded by so many organizations that leadership in any strict sense is not possible. Still, the NCI and its director have enormous potential to lead the nation's efforts through the NCI's "convening power"—the ability to bring people together from all sectors working on cancer and to think cooperatively about how to solve our most difficult problems.

Funding for many kinds of medical research—including cancers—has slowed in recent years and at a time when medical and technological opportunities are increasing.

This slowdown in funding has come, ironically, at a time of

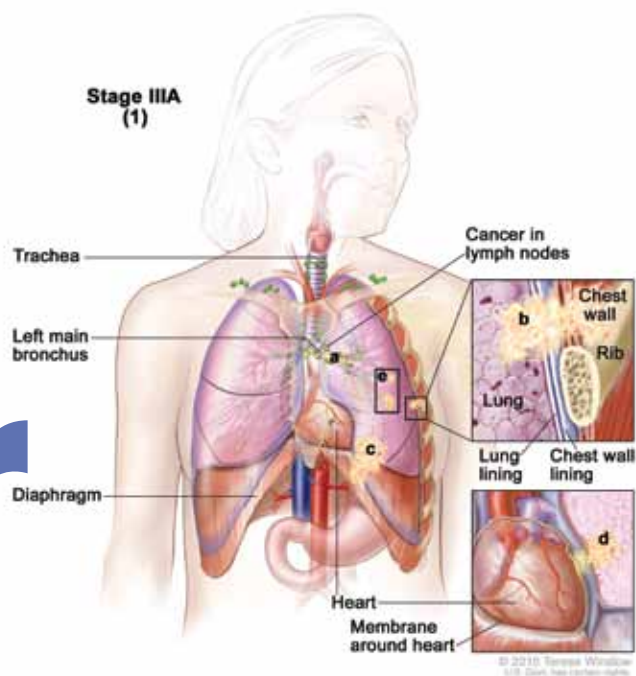
It is not, for example, a "war on cancer" as a single enemy. It is many different diseases with common themes that can cause different kinds of disorders in many of our organs.

unmatched promise in the cancer sciences and at a time when the world of cancer research has expanded in talent, facilities, and ideas.

We must balance our knowledge about the public health burden of each cancer type against the knowledge that the sources of our greatest advances are difficult to predict and often emerge from unexpected places. Scientific opportunity, the richness of experimental ideas, and the talent of investigators must be taken into account, along with the toll taken by individual cancer types, if we are to spend our funds wisely and earn public trust. **MP**

For more information, please visit www.cancer.gov.

Understanding and Preventing Lung Cancer



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What Is Lung Cancer?

Lung cancer forms in tissues of the lung, usually in the cells lining air passages. The two main types are small cell lung cancer and non-small cell lung cancer. These types are diagnosed based on how the cells look under a microscope.

- **Small cell:** The cells of small cell lung cancer look small under a microscope. About 1 of every 8 people with lung cancer has small cell lung cancer.
- **Non-small cell:** The cells of non-small cell lung cancer are larger than the cells of small cell lung cancer. Most (about 7 of every 8) people diagnosed with lung cancer have non-small cell lung cancer. It doesn't grow and spread as fast as small cell lung cancer, and it's treated differently.

Lung cancer is the leading cause of cancer death in both men and women. Lung cancer is the second most common cancer in the United States, after skin cancer. The number of new cases and deaths from lung cancer is highest in black men.

In 2012, more than 226,000 Americans were estimated to be diagnosed with lung cancer. Deaths from lung cancer in 2012 were expected to total more than 160,000.

Risk Factors

Smoking is the main cause of lung cancer, especially non-small cell lung cancer. Exposure to secondhand smoke and environmental exposures, such as radon and workplace toxins, also increase your risk.

The earlier in life a person starts smoking, the more often a person smokes, and the more years a person smokes, the greater the risk of lung cancer. If a person

has stopped smoking, the risk becomes lower as the years pass.

When smoking is combined with other risk factors—such as secondhand smoke, asbestos and arsenic exposure, and air pollution—the risk of lung cancer is increased. A family history of cancer can also be a risk factor for lung cancer.



▲ Lung cancer survivor Dusty Donaldson helps to spread the word about the importance of screening and early detection.

Photo: Courtesy Dusty Donaldson

Early Detection Is the Key

In 2005, Dusty Donaldson experienced tenderness and pain in her neck that didn't go away over several months. When her doctor couldn't detect any physical cause, and the pain continued, Donaldson decided more had to be done. "The pain was persistent, and so was I."

Today, she's thankful for her persistence. Ultrasound and CT scans found something suspicious in her right lung. That turned out to be a five-centimeter cancerous tumor between the upper and middle lobes of her lungs. It was an early-stage cancer and had not spread to other parts of her lungs or her body.

Donaldson, who had quit smoking 26 years before her diagnosis, had not even considered that she might have lung cancer.

"I was really surprised at the time to find out that lung cancer is the number one cause of cancer deaths in men and women. More people die from lung cancer than from all the others combined," Donaldson says. "Lung cancer death rates are the equivalent of a 747 jumbo jet crashing to the ground every single day."

Surgeons removed almost two-thirds of her lung and treated her with chemotherapy for three months. Today, she remains cancer free and has made a commitment to help others understand lung cancer and the need for early detection. Donaldson volunteers with the nonprofit LUNGevity Foundation to help the organization educate the public about lung cancer.

"I'm compelled to find others and share with them information regarding screening," she says. "Early detection is key to survivorship," she adds. "There's not a single soul on this earth who doesn't need to know about lung cancer. People who don't know they are at risk, need to know that there are other risk factors—genetics, radon, and other things that can cause lung cancer."

The 2011 National Cancer Institute's National Lung Screening Trial showed the importance of detecting lung cancer early. The trial also showed for the first time an effective screening approach for a high-risk population.

"Now thanks to the National Lung Screening Trial, we know screening can be more effective than anything else," says Donaldson. "People who are at great risk don't have to consider themselves doomed to lung cancer. They can have early detection, get treated early, and hopefully live a long and healthy life."

"If I could tell the world one thing about lung cancer, it's that anyone can get it ... and no one deserves it."

—Dusty Donaldson, 58,
High Point, NC

Symptoms

Possible signs of non-small cell lung cancer include a cough that doesn't go away and shortness of breath. Check with your doctor or other health professional if you have any of the following problems:

- Chest discomfort or pain.
- A cough that doesn't go away or gets worse over time.
- Trouble breathing.
- Wheezing.
- Blood in sputum (mucus coughed up from the lungs).
- Hoarseness.
- Loss of appetite.
- Weight loss for no known reason.
- Feeling very tired.
- Trouble swallowing.
- Swelling in the face and/or veins in the neck.



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▲X-ray of the chest. X-rays are used to take pictures of organs and bones of the chest. X-rays pass through the patient onto film.

Diagnosis

Tests that examine the lungs are used to detect (find), diagnose, and stage non-small cell lung cancer. Tests and procedures to detect, diagnose, and stage non-small cell lung cancer are often done at the same time. Some of the following tests and procedures may be used:

- **Physical exam and history:** An exam of the body to check general signs of health, including checking for signs of disease, such as lumps or anything else that seems unusual. A history of the patient's health habits, including smoking, and past jobs, illnesses, and treatments will also be taken.
- **Laboratory tests:** Medical procedures that test samples of tissue, blood, urine, or other substances in the body. These tests help to diagnose disease, plan and check treatment, or monitor the disease over time.
- **Chest X-ray:** An X-ray of the organs and bones inside the chest. An X-ray is a type of energy beam that can go through the body, making a picture of areas inside the body.
- **CT scan (CAT scan):** A procedure that makes a series of detailed pictures of areas inside the body, such as the chest, taken from different angles. The pictures are made by a computer linked to an X-ray machine. A dye may be injected into a vein or swallowed to help the organs or tissues show up more clearly.
- This procedure is also called computed tomography, computerized tomography, or computerized axial tomography.
- **Lung biopsy.** The patient lies on a table that slides through the computed tomography (CT) machine, which takes X-ray pictures of the inside of the body. The X-ray pictures help the doctor see where the abnormal tissue is in the lung. A biopsy needle is inserted through the chest wall and into the area of abnormal lung tissue. A small piece of tissue is removed through the needle and checked under the microscope for signs of cancer.
- **Bronchoscopy:** A procedure to look inside the trachea and large airways in the lung for abnormal areas. A bronchoscope is inserted through the nose or mouth into the trachea and lungs. A bronchoscope is a thin, tube-like instrument with a light and a lens for viewing. It may also have a tool to remove tissue samples, which are checked under a microscope for signs of cancer.

Treatments

Certain factors affect prognosis (chance of recovery) and treatment options.

- The stage of the cancer (the size of the tumor and whether it is in the lung only or has spread to other places in the body).
- The type of lung cancer.
- Whether there are symptoms such as coughing or trouble breathing.
- The patient's general health.

For patients with advanced non-small cell lung cancer, current treatments do not cure the cancer. The treatment that's right for you depends mainly on the type and stage of lung cancer. You may receive more than one type of treatment.

Surgery

Surgery may be an option for people with early-stage lung cancer. The surgeon usually removes only the part of the lung that contains cancer. Most people who have surgery for lung cancer will have the lobe of the lung that contains the cancer removed. This is a lobectomy. In some cases, the surgeon will remove the tumor along with less tissue than an entire lobe, or the surgeon will remove the entire lung. The surgeon also removes nearby lymph nodes.

Radiation Therapy

Radiation therapy is an option for people with any stage of lung cancer:

- People with early lung cancer may choose radiation therapy instead of surgery.
- After surgery, radiation therapy can be used to destroy any cancer cells that may remain in the chest.
- In advanced lung cancer, radiation therapy may be used with chemotherapy.

The NCI booklet *Radiation Therapy and You* (www.cancer.gov/cancertopics/coping/radiation-therapy-and-you) has helpful ideas for coping with radiation therapy side effects.

Chemotherapy

Chemotherapy may be used alone, with radiation therapy, or after surgery.

Chemotherapy uses drugs to kill cancer cells. The drugs for lung cancer are usually given directly into a vein (intravenously) through a thin needle. Newer chemotherapy methods, called targeted treatments, are often given as a pill that is swallowed.

You'll probably receive chemotherapy in a clinic or at the doctor's office. People rarely need to stay in the hospital during treatment.

The side effects depend mainly on which drugs are given and how much. Chemotherapy kills fast-growing cancer cells, but the drugs can also harm normal cells that divide rapidly:

- When drugs lower the levels of healthy blood cells, you're more likely to get infections, bruise or bleed easily, and feel very weak and tired.
- Chemotherapy may cause hair loss. If you lose your hair, it will grow back after treatment, but the color and texture may be changed.
- Chemotherapy can cause a poor appetite, nausea and vomiting, diarrhea, or mouth and lip sores. Your healthcare team can give you medicines and suggest other ways to help with these problems.

The NCI booklet *Chemotherapy and You* (www.cancer.gov/cancertopics/coping/chemotherapy-and-you) has helpful ideas for coping with chemotherapy side effects.

Targeted Therapy

People with non-small cell lung cancer that has spread may receive a type of treatment called targeted therapy. Several kinds of targeted therapy are used for non-small cell lung cancer. One kind is used only if a lab test on the cancer tissue shows a certain gene change. Targeted therapies can block the growth and spread of lung cancer cells.

Depending on the kind of drug used, targeted therapies for lung cancer are given intravenously or by mouth.

Questions to Ask Your Health Professional

Tests

- What type of lung cancer do I have?
- Has the cancer spread from the lung? If so, to where?
- May I have a copy of test results?

Surgery

- What kind of surgery do you suggest for me?
- How will I feel after surgery?
- If I have pain, how can we control it?
- How long will I be in the hospital?
- Will I have any lasting side effects?
- When can I get back to my normal activities?

Radiation Therapy

- When will treatment start? When will it end? How often will I have treatments?
- How will I feel during treatment? Will I be able to drive myself to and from treatment?

- What can I do to take care of myself before, during, and after treatment?
- How will we know the treatment is working?
- What side effects should I expect? What should I tell you about?
- Are there any lasting effects?

Chemotherapy or Targeted Therapy

- Which drug or drugs do you suggest for me? What will they do?
- What are the possible side effects? What can we do about them?
- When will treatment start? When will it end? How often will I have treatments?
- How will we know the treatment is working?
- Will there be lasting side effects?

Smoking and Lung Cancer: It's Never Too Late to Quit

Because most people who get lung cancer were smokers, you may feel that doctors and other people assume that you are or were a smoker (even if you aren't or weren't). Whether or not you were a smoker, it's important for you to protect your body now from smoke. Avoid secondhand smoke from smokers near you.

If you smoke, talk with an expert about quitting. It's never too late to quit. Quitting can help cancer treatments work better. It may also reduce the chance of getting another cancer.

To get help with quitting smoking...

- Go online to www.smokefree.gov. (See this issue's back cover for more information.)
- Call NCI's Smoking Quitline at **1-877-44U-QUIT (1-877-448-7848)**.
- Sign up for the free mobile service **SmokefreeTXT** to get tips and encouragement to quit. To sign up, text the word QUIT to IQUIT (47848) from your mobile phone. Or, go to www.smokefree.gov/smokefreetxt/Signup.aspx.



Photo: iStock Photo



Photo: iStock Photo

▲ Man receiving radiation therapy for lung cancer treatment

Lung Cancer Research

- The large-scale National Lung Screening Trial, supported by the National Cancer Institute (NCI), has shown that screening current or former heavy smokers with low-dose helical computed tomography (CT) decreases the risk of dying from lung cancer. That finding was only for heavy smokers.
- Another recent study showed that low-dose nicotine does not enhance lung cancer development. This suggests that nicotine replacement therapy is safe for former smokers.
- Results of a 2011 research trial revealed that annual chest X-ray screening of people ages 55 to 74 years does not reduce lung cancer deaths compared with usual care.
- Researchers have identified genetic regions that predispose Asian women who've never smoked to lung cancer. The finding provides evidence that lung cancer between smokers and never-smokers can differ on a fundamental level.

MP

To Find Out More

- MedlinePlus: www.medlineplus.gov Type "lung cancer" into Search box.
- www.smokefree.gov (See this issue's back cover for more information.)
- Be Tobacco Free: www.BeTobaccoFree.gov brings together information on the health effects of tobacco, quitting smoking, and more.
- ***The What You Need To Know About™ Lung Cancer booklet*** (www.cancer.gov/cancertopics/wyntk/lung) provides information about lung cancer diagnosis, staging, treatment, and comfort care. Information specialists also can answer questions about cancer at 1-800-4-CANCER.
- The NCI **Lung Cancer Home Page** provides up-to-date information on lung cancer treatment, prevention, genetics, causes, screening, testing, and related topics. (www.cancer.gov/cancertopics/types/lung)
- Information on treatment options for **non-small cell lung cancer** and **small cell lung cancer** is available from PDQ, NCI's comprehensive cancer database. (www.cancer.gov/cancertopics/pdq)
- Clinical trials for non-small cell lung cancer and small cell lung cancer can be found in NCI's list of clinical trials. (www.cancer.gov/clinicaltrials)



Living Better with Osteoarthritis

What Is Osteoarthritis?

Osteoarthritis is the most common type of arthritis. People usually have joint pain and stiffness. Unlike rheumatoid arthritis, it does not affect skin tissue, the lungs, eyes, or blood vessels.

In osteoarthritis, cartilage—the hard, slippery tissue that protects the ends of bones where they meet to form a joint—wears away. The bones rub together, causing pain, swelling, and loss of motion. Over time, the joint also may lose its normal shape. Bone spurs—small deposits of bone—may grow on the edges of the joint. Also, bits of bone or cartilage can break off inside, causing more pain and damage.

Where does osteoarthritis occur?

Hands—Osteoarthritis of the hands seems to run in families. Women are more likely than men to have hand involvement. For most, it develops after menopause. Small, bony knobs may appear on the end joints (those closest to the nails) of the fingers. Fingers can become enlarged and gnarled, and may ache or be stiff and numb. The base of the thumb joint also is commonly affected.

Knees—Symptoms include stiffness, swelling, and pain. This makes it hard to walk, climb, and get in and out of chairs and bathtubs.

Hips—There is pain and stiffness of the joint itself. But sometimes pain is felt in the groin, inner thigh, buttocks, or even the knees. Osteoarthritis of the hip may limit moving and bending. This can make dressing or other daily activities a challenge.

Spine—There is stiffness and pain in the neck or lower back. In some cases, arthritis-related changes in the spine can put pressure on the nerves where they exit the spinal column. This results in weakness, tingling, or numbness of the arms and legs. In severe cases, bladder and bowel function can be affected.

Osteoarthritis Basics: The Joint and Its Parts

Joints allow movement between the bones and absorb the shock from walking or other repetitive motion. Joints are made up of:

Cartilage. A hard, slippery coating on the end of each bone.

Joint capsule. A tough membrane that encloses all the bones and other joint parts.

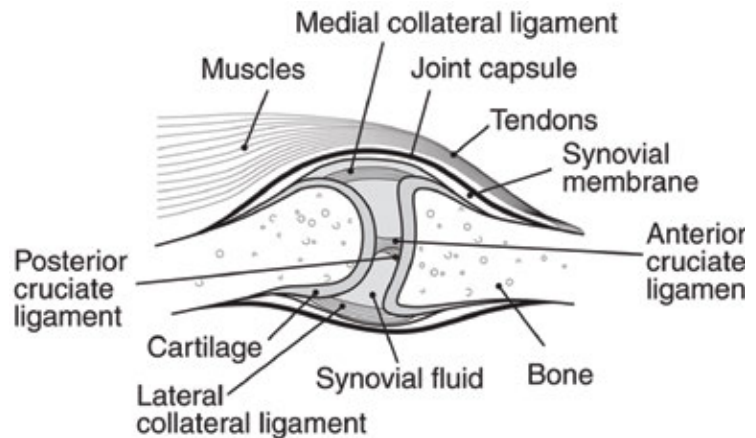
Synovium (sin-O-vee-um). A thin membrane inside the joint capsule that secretes synovial fluid.

Synovial fluid. A fluid that lubricates the joint and keeps the cartilage smooth and healthy.

Ligaments, tendons, and muscles. Tissues that surround the bones and joints, allowing the joints to bend and move. Ligaments are tough, cord-like tissues that connect one bone to another. Tendons are tough fibers that connect muscles to bones. Muscles are bundles of specialized cells that, when stimulated by nerves, either relax or contract to produce movement.

A Healthy Joint

In a healthy joint, the ends of bones are encased in smooth cartilage. Together, they are protected by a joint capsule lined with a synovial membrane that produces synovial fluid. The capsule and fluid protect the cartilage, muscles, and connective tissues.



A Joint With Severe Osteoarthritis

With osteoarthritis, the cartilage wears away. Spurs grow out from the edge of the bone, and synovial fluid increases. The joint feels stiff and sore.

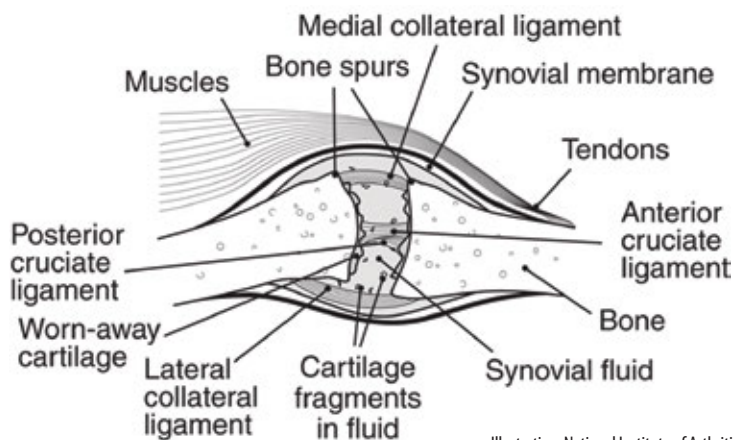


Illustration: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)



Fast Facts!

- ✓ Osteoarthritis is the most common type of arthritis. More common in older people, it is sometimes called degenerative joint disease.
- ✓ Osteoarthritis most often occurs in the hands (at the ends of the fingers and thumbs), spine (neck and lower back), knees, and hips.
- ✓ Some 27 million Americans age 25 and older have osteoarthritis.
- ✓ Osteoarthritis is more likely in overweight people and among those with jobs that stress particular joints.
- ✓ Exercise is one of the best treatments for osteoarthritis.
- ✓ Before age 45, osteoarthritis is more common in men. After 45, it is more common in women.

Diagnosis

A combination of the following methods are used to diagnose osteoarthritis:

Clinical history—You will be asked when the condition started and how your symptoms have changed since. You will also describe any other medical problems you or your family may have, and any medications being taken. This helps your doctor make a diagnosis and understand the disease's impact on you.

Physical examination—Your doctor checks your strength, reflexes, and general health. She or he also examines bothersome joints and observes your ability to walk, bend, and carry out daily activities, such as dressing.

X rays—X-rays will help determine the form of arthritis and how much damage there is, including cartilage loss, bone damage, and bone spurs.

Magnetic resonance imaging—Magnetic resonance imaging (MRI) provides high-resolution computerized images of internal body tissues. It is used if there is pain, X-rays don't show much, or there is damage to other joint tissues.

Other tests—Your doctor may order blood tests to rule out other causes of symptoms. Fluid may also be drawn from the joint for microscopic examination to determine whether the pain is from a bacterial infection or uric acid crystals, indicating gout.

Treatment

Doctors often combine treatments to fit a patient's needs, lifestyle, and health. Osteoarthritis treatment has four main goals: Improve joint function, keep a healthy body weight, control pain, and achieve a healthy lifestyle. Treatment plans can involve:

Exercise—Research shows that exercise can improve mood and outlook, decrease pain, increase flexibility, strengthen the heart and improve blood flow, maintain weight, and promote general physical fitness. Your doctor and/or physical therapist can recommend the exercises best for you.

Weight control—Weight loss can reduce stress on weight-bearing joints, limit further injury, and increase mobility. A healthy diet and regular exercise help reduce weight. A dietitian can help you develop healthy eating habits.

Rest and relief from stress on joints—Learn to recognize the body's signals, and know when to stop or slow down. Regularly scheduled rest prevents pain from overexertion. Proper sleep is important for managing arthritis pain. If you have trouble sleeping, relaxation techniques, stress reduction, and biofeedback can help.

Warning Signs of Osteoarthritis

- **Pain and stiffness** in a joint after getting out of bed or sitting for long.
- **Swelling** in one or more joints, especially those at the ends of the fingers (closest to the nail), thumbs, neck, lower back, knees, and hips.
- **Crunching feeling** or the sound of bone rubbing on bone
- **Osteoarthritis may progress quickly**, but in most people it develops gradually. It is relatively mild and interferes little with daily life in some people. Others have significant pain and disability.
- **If you feel hot or your skin turns red**, or if your joint pain is accompanied by a rash, fevers, or other symptoms, you probably do not have osteoarthritis. Check with your health provider about possible other causes, such as rheumatoid arthritis.

Nondrug pain relief and alternative therapies—You may find relief from:

- **Heat or cold** (or a combination of both). Heat—with warm towels, hot packs, or warm bath or shower—can increase blood flow and ease pain and stiffness. Cold packs (bags of ice or frozen vegetables wrapped in a towel) can reduce inflammation, relieving pain or soreness.
- **Massage** uses light stroking and/or kneading of the muscles to increase blood flow and warm the stressed joint.
- **Complementary and alternative therapies**—Some people have found relief from such therapies as acupuncture. A large study supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) and the National Center for Complementary and Alternative Medicine (NCCAM) showed that acupuncture can relieve pain and improve function in knee osteoarthritis.
- **Nutritional supplements**—such as glucosamine and chondroitin sulfate have been reported to improve osteoarthritis symptoms in some people.

“No pills yet ...”

“There are no pills yet for osteoarthritis, but we’re working on it,” says Linda Sandell, Ph.D., professor of Orthopaedic Surgery and of Cell Biology at the Washington University School of Medicine, in St. Louis. In osteoarthritis, the soft tissue called cartilage, which cushions the knees and other joints of the body, wears away, causing pain and loss of mobility.

“It’s a huge and growing public health issue,” says Sandell, who points out that more than 50 percent of people age 65 and over have osteoarthritis. “But it is not just a disease of old age; people get it when they’re young, too.”

Under a multi-year grant from the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), she and her colleagues are studying stem cells in specially bred mice to determine whether there is a correlation between injury and healing.

“Every person has stem cells, and some people are better at repairing than others,” Sandell observes. “We need to find the gene, or genes, for cartilage repair and osteoarthritis in these mice, and target these genes in the development of medications that could be used in humans.”

“But like heart disease or obesity, osteoarthritis is a complex disease; the research is difficult and expensive, and improve-

ments are hard to measure. We need to change its image as an inevitable result of old age. It has a molecular start, and it takes a long time to develop. People often don’t realize that their joints are degenerating until late in the process when they begin to hurt.”

Sandell says people can’t change their age but they can reduce the risks of osteoarthritis, which, in addition to genetics, include prior joint injuries and being overweight, through exercise and a healthy diet. “First,” she urges, “no more couch potato. Check with your doctor, then start walking a couple of miles a day. Use—but don’t overuse—your joints.

“Pay attention to what your body is telling you. If your cartilage is okay but your knee is inflamed, ice it,” she advises. “Keeping fit is one of the keys to delaying arthritis.”



Photo: Robert Boston

▲ Linda Sandell, Ph.D. (center), in her lab with summer students Alexis Webber (left) and Celine St. Pierre.

“Every person has stem cells, and some people are better at repairing than others.”

Medications

When selecting medicines, your doctor will consider the intensity of pain, potential side effects of the medication, your medical history, and other medications you are taking. By working together, you and she or he can find the medication that best relieves your pain with the least risk of side effects.

The following medicines are commonly used to treat osteoarthritis:

Acetaminophen—A common over-the-counter pain reliever. It is often the first choice for osteoarthritis patients because of its safety and effectiveness compared to some other drugs.

NSAIDs (non-steroidal anti-inflammatory drugs)—A large class of medications for both pain and inflammation. It includes aspirin, ibuprofen, naproxen, and others. Some NSAIDs are available over the counter, while more than a dozen others are available only with a prescription. NSAIDs can have significant side effects. Anyone taking NSAIDs regularly should be monitored by a doctor.

Narcotic or central acting agents—Mild narcotic painkillers containing codeine or hydrocodone are often effective against osteoarthritis pain. But because of their potential for physical and psychological dependence, they are generally for short-term use.

Corticosteroids—Powerful anti-inflammatory hormones that may be injected into the affected joints for temporary relief. No more than four treatments per year are recommended.

Hyaluronic acid substitutes—These medications are injected to help lubricate and nourish joints. They are approved only for osteoarthritis of the knee.

Other medications—Doctors also may prescribe topical pain-relieving creams, rubs, and sprays, which are applied directly to the skin over painful joints. Because most medicines used to treat osteoarthritis have side effects, it is important to learn as much as possible about the medications you take, even the ones available without a prescription.

To Find Out More

- **MedlinePlus** www.nlm.nih.gov/medlineplus
- **National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)** www.niams.nih.gov
- **NIH Osteoporosis and Related Bone Diseases~National Resource Center** www.bones.nih.gov
- **National Institute on Aging (NIA) Information Center** www.nia.nih.gov/

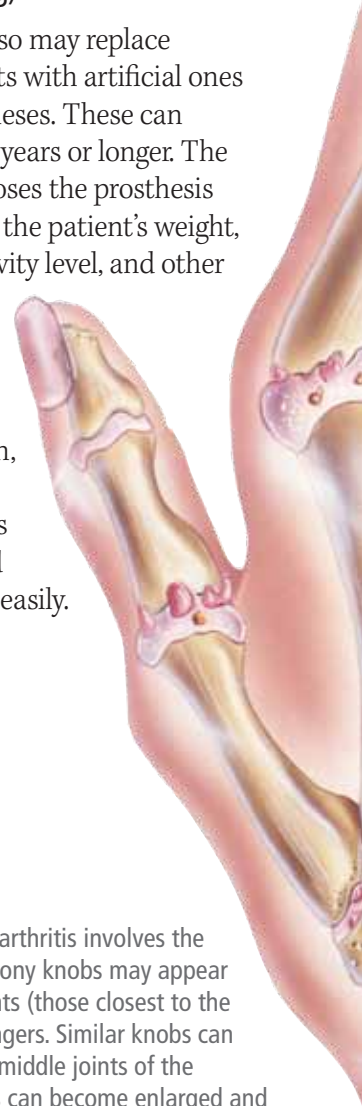
Surgery

For many people, surgery helps relieve the pain and disability of osteoarthritis. You may have surgery to:

- **remove loose pieces of bone and cartilage (arthroscopy)**
- **reposition bones (osteotomy)**
- **resurface bones (joint resurfacing).**

Surgeons also may replace affected joints with artificial ones called prostheses. These can last up to 15 years or longer. The surgeon chooses the prosthesis according to the patient's weight, sex, age, activity level, and other medical conditions.

After surgery and rehabilitation, the patient typically feels less pain and moves more easily.



► When osteoarthritis involves the hands, small, bony knobs may appear on the end joints (those closest to the nails) of the fingers. Similar knobs can appear on the middle joints of the fingers. Fingers can become enlarged and gnarled, and they may ache or be stiff and numb.



Research Findings

Osteoarthritis is not simply “wear and tear” in joints as people get older. Researchers are studying:

- Tools to detect osteoarthritis earlier
- Genes
- Tissue engineering—special ways to grow cartilage to replace damaged cartilage
- Medicines to prevent, slow, or reverse joint damage
- Complementary and alternative therapies
- Vitamins and other supplements
- Education to help people better manage their osteoarthritis
- Exercise and weight loss to improve mobility and decrease pain
- Researchers are learning about sex differences that explain why women are more susceptible than men to anterior cruciate ligament (ACL) injuries, which can lead to osteoarthritis. These include structural differences of the knee joint and thigh muscles and differences in the ways male and female athletes move. They are also developing ways to protect young female athletes from these injuries.
- Discovery of the various genetic mutations leading to osteoarthritis could lead to new treatments.
- Longer-lasting materials and designs that more closely mimic natural knee movement are making total joint replacements more suitable for younger, more active osteoarthritis patients.
- Despite the benefits, African American and Asian American patients are less likely than their white counterparts to choose total knee replacement. Also, researchers have found that race is more important than socioeconomic status in these decisions. That is an important first step toward improving access to knee surgery, and to help all patients make informed decisions about their treatment.
- Surgical advances have made hip replacements safer for older patients. This helps older patients who have other conditions that previously would not have allowed them to have the procedure.
- Less invasive surgical approaches and preoperative exercise programs have led to decreased hospital stays and faster recovery. If adopted nationwide, they could lead to major cost savings. **MP**

The earlier children with **autism spectrum disorders** (ASDs) are diagnosed, the better. Most are not diagnosed until after age 4. It's important for doctors to screen all children for ASDs.



Autism Spectrum

Former NFL star quarterback Dan Marino and his wife Claire experienced a parents' nightmare: One of their children was diagnosed with autism, known today as autism spectrum disorders (ASD). But what they did next changed not only their lives, but those of many others.

For most parents, the news that their child has an autism spectrum disorder (ASD) brings an initial reaction of overwhelming alarm and even despair. It can seem as if the doors to the future are being slammed shut for their child.

That's certainly the feeling that Dan and Claire Marino had when they were told in 1992 that their 3-year-old son Michael had autism.

"We didn't know what it was," says Dan Marino today. "We actually had to look it up in an encyclopedia."

"We lost our breath, and we thought, what are we going to do now?" adds Claire. "We were so fortunate with Michael. He progressed so beautifully and has done

so well. But it was just overwhelming. There was not much out there for us at the time."

The year was 1992, and the Marinos were in shock.

"But then we took it head on and said, 'We're going to do whatever we can to help Michael to get the best help. We want to give him the best chance he can have to succeed in life,'" says the former NFL star. "That's where the focus for The Dan Marino Foundation started.

Motivated by their personal experiences raising Michael, the Marinos were determined to help other children with autism and their families. That same year, they started The Dan Marino Foundation with the mission to "open doors"

toward independence for children and young adults with autism and special needs by creating awareness and opportunities.

More than two decades later, the foundation has raised more than \$39 million to fund the Miami Children's Hospital Dan Marino Center and the Marino Autism Research Institute funding quality-of-life research.

The Marino Foundation understands that parents of young adults with special needs are concerned that their children won't have the skills or education to live independently and be employed. In 2008, the Foundation launched Summer STEPS (Supported Training and Employment Program for Special Needs). In STEPS, teenagers and young adults with developmental disabilities gain experience in a supported work environment, learning communication, social, and teamwork skills.



ASD Disorders



Photo: Dan Marino Foundation

◀ Claire and Dan Marino have been helping children with autism spectrum disorders (ASD) for more than 20 years through their Dan Marino Foundation.

In 2014, the Foundation plans to open the Marino Vocational College in downtown Fort Lauderdale, a post-secondary vocational school for young adults with disabilities. Participants will receive the guidance and support needed to achieve vocational certification—including job placement services. The Foundation hopes that both initiatives will serve as models for similar efforts across the country.

“Dan and Claire’s commitment to excellence—supporting great clinical care and realizing that clinical care can only improve through research—is visionary,” says Pat Levitt, Ph.D., director of The Vanderbilt Kennedy Center for Research on Human Development.

Today, 24-year-old Michael Marino has joined his parents in helping to advocate for more ASD research and public understanding.

To find out more, visit www.danmarinofoundation.org.



Fast Facts!

- ✓ Autism Spectrum Disorders (ASD) are a group of developmental brain disorders. They can cause major social, communication, and behavioral challenges.
- ✓ The Centers for Disease Control and Prevention (CDC) estimates approximately 1 in 88 children in the United States has an ASD.
- ✓ ASDs begin before age three. They last for life, although symptoms may improve over time.
- ✓ ASDs occur in all racial, ethnic, and socioeconomic groups. They are almost five times as common among boys as girls.
- ✓ The main research-based treatment for ASDs is behavioral intervention. This involves structured teaching of skills. It is very important to begin as early as possible in order to help a child reach his or her full potential.

What Are Autism Spectrum Disorders (ASD)?

Autism is a group of brain development disorders. They are also called autism spectrum disorders (ASD) because of the wide range of symptoms, skills, and levels of impairment, or disability, that children with ASD can have. Symptoms usually start before age three. They can delay or cause problems in many different skills that develop from infancy to adulthood. The main signs and symptoms of autism involve problems with communication, social interactions, and repetitive behaviors.

Children with ASD:

- might have problems learning to talk or having a conversation
- might not look people in the eye when talking
- may have to line up toys or other objects before they can pay attention
- may say the same sentence again and again to calm themselves down
- may flap their arms or flick their fingers to tell others they are happy, sad, or anxious
- might hurt themselves to tell others they are not happy.

Children with ASD may vary from mildly impaired to severely disabled. Some people with autism never learn how to talk.

Symptoms

Symptoms of autism spectrum disorders (ASD) vary from child to child but generally fall into three areas:

- **Communication**—both verbal (spoken) and non-verbal (unspoken, such as pointing, eye contact, and smiling)
- **Social**—such as sharing emotions, understanding how others think and feel, and holding a conversation
- **Routines or repetitive behaviors** (also called stereotyped behaviors)—such as repeating words or actions, obsessively following routines or schedules, and playing in repetitive ways

Children with ASD do not follow typical patterns of development when it comes to social and communication skills. Parents are usually the first to notice this. Often, certain behaviors become more noticeable when they compare their children to others of the same age.

In some cases, babies with ASD may seem very different early in their development. Even before their first birthdays, some become overly focused on certain objects, rarely make eye contact, and fail to engage in typical back-and-forth play and babbling with their parents. Other babies may develop normally until they are two or three, but then start to lose interest in others. They become silent, withdrawn, or indifferent to social signals.

Some Types of ASD

- **Autistic disorder (classic autism):** This is what most people think of when hearing the word “autism.” People with autistic disorder usually have major language delays, social and communication challenges, and unusual behaviors and interests. Many also have intellectual disability.
- **Asperger’s disorder (Asperger syndrome):** People

- with Asperger syndrome might have social challenges and unusual behaviors and interests. However, they typically do not have problems with language or intellectual disability.
- **Pervasive developmental disorder not otherwise specified (PDD-NOS):** People who meet some of the criteria for autistic disorder or Asperger syndrome, but not all, may be diagnosed with PDD-NOS. They may have only social and communication challenges.



Photo: iStock Photo

Social Impairment

Most children with ASD have trouble engaging in everyday social interactions. They may:

- Make little eye contact
- Tend to look and listen less to people in their regular environment or fail to respond to other people
- Not readily seek to share their enjoyment of toys or activities by pointing or showing things to others
- Respond unusually when others show anger, distress, or affection

Communication Issues

By their first birthdays, typical toddlers can say one or two words, turn when they hear their names, and point when they want a toy, according to the American Academy of Pediatrics' developmental milestones. When offered something they do not want, they make it clear through words, gestures, or facial expressions that the answer is "no."

Children with ASD may have trouble reaching such milestones. For example, some may:

- Fail or be slow to respond to their names or other verbal attempts to gain their attention
- Fail or be slow to develop gestures, such as pointing and showing things to others
- Coo and babble in the first year of life, but then stop

- Develop language at a delayed pace
- Learn to communicate using pictures or their own sign language
- Speak only in single words or repeat certain phrases over and over
- Repeat words or phrases that they hear, a condition called echolalia
- Use words that seem odd, out of place, or have special meaning known only to those familiar with the child's way of communicating.

Behaviors

Children with ASD often have repetitive motions or unusual behaviors. For example, some children may repeatedly flap their arms or walk in specific patterns. Others may subtly move their fingers by their eyes in what looks to be a gesture. These repetitive actions are called "stereotyped behaviors."

Children with ASD also tend to have overly focused interests. They may become fascinated with moving objects or parts of objects, like the wheels on a moving car. They might spend a long time lining up toys in a certain way, rather than playing with them. They may also become very upset if someone accidentally moves one of the toys. Children with ASD often have great interest in numbers, symbols, or science topics.

How Common Is ASD?

There are various estimates of the number of children with ASD. A Center for Disease Control and Prevention (CDC) survey found that around 1 in 88 children has ASD. Although higher than in previous studies, experts disagree whether this shows a true increase in ASD. This is because guidelines for diagnosis have changed. Also, many more parents and doctors now know about ASD, so parents are more likely to have their children diagnosed. Boys are at four to five times greater risk than girls.

Treatment

There is no cure for ASD, and no one single treatment that is recommended. There are ways to help minimize ASD symptoms and to maximize learning.

Behavioral therapy and other therapeutic options

- Behavior management therapy helps to reinforce wanted behaviors, and reduce unwanted behaviors.
- Speech-language therapists can help people with ASD improve their ability to communicate and interact with others.
- Occupational therapists can help people find ways to adjust tasks to match their needs and abilities.
- Physical therapists design activities and exercises to build motor control and improve posture and balance.

Educational and/or school-based options

- Public schools are required to provide free, appropriate public education from age 3 through high school or age 21, whichever comes first.
- Typically, a team of people, including the parents/caregivers, teachers, school psychologists, and other child development specialists work together to design an Individualized Education Plan (IEP) to help guide the child's school experience.

Medication options

- Currently, there are no medications to cure autism spectrum disorders or all of the symptoms. The U.S. Food and Drug Administration (FDA) has not approved any medications specifically for the treatment of ASD, but in many cases medication can treat some of the associated symptoms.
- Healthcare providers might use some of these medicines to treat the symptoms of autism spectrum disorders
 - Antidepressants such as selective serotonin reuptake inhibitors (SSRIs) or tricyclics
 - Psychoactive/anti-psychotics
 - Stimulants

Diagnosis

ASD diagnosis is often a two-stage process. The first involves general screening during well-child check-ups with a pediatrician or early childhood healthcare provider. Children who show some developmental concerns are referred for additional evaluation.

The second stage involves thorough evaluation by a team of doctors and other health specialties. At this stage, a child may be diagnosed as having ASD or another developmental disorder.

Children with autism spectrum disorders (ASD) usually can be diagnosed by age 2. Some screening tests can be helpful at 18 months or even younger. However, children with milder symptoms may not be diagnosed until age 3 or older.

Early diagnosis is important, because early intervention can reduce or prevent the more severe disabilities associated with ASD. Early intervention may also improve a child's adaptive behavior—her or his IQ, language, and everyday functional skills.

Autism and Vaccines

There is no conclusive scientific evidence that any part of a vaccine or combination of vaccines causes autism. There is also no proof that any material used to make or preserve vaccines plays a role in causing autism.

Currently, the U.S. Centers for Disease Control and Prevention (CDC) provides the most accurate and up-to-date information about research on autism and vaccines. Its Concerns About Vaccines and Autism (www.cdc.gov/vaccinesafety/Concerns/Autism/Index.html) website provides information from the federal government and from independent organizations about vaccines and autism.





Videos and Audio About ASD

from the National Institute of Mental Health (NIMH) www.nimh.nih.gov/news/media/index-autism.shtml

At its website, NIMH offers free videos and audio for the public about autism spectrum disorders, along with a wealth of additional research and information resources.

Research

Recent research has focused on finding the earliest signs of autism spectrum disorders (ASD). The aim is to help health professionals diagnose children at younger ages, so they can get help as quickly as possible.

For example, one early sign of ASD may be increased head size or rapid head growth. Brain imaging studies have shown that abnormal brain development in an infant's first months may have a role in ASD.

Other studies have found that unusual eye gaze patterns may be apparent in the first year of life. Infants with ASD seem to look at objects more than people, and seem to prefer geometric patterns over watching the movements of other children.

Current studies on ASD treatment are exploring such approaches as:

- Computer-based training to teach children with ASD how to create and respond correctly to facial expressions
- A medication to help improve functioning in children with Fragile X syndrome—a genetic condition that results in intellectual disability
- Social strategies that can be used in the classroom or other “everyday” settings
- Teaching very young children with ASD “joint attention” skills, such as showing or pointing to objects of interest, and responding to someone who is trying to play with them
- Training adolescents and adults with ASD in employment skills, such as writing a resume and interviewing for a job

To Find Out More

- MedlinePlus: www.medlineplus.gov; Type “autism” in the search box.
- Eunice Kennedy Shriver National Institute of Child Health & Human Development (NICHD) booklets: www.nichd.nih.gov/publications/pubs/autism/overview/Pages/index.aspx
 - Autism Overview: What We Know
 - Autism and Genes
 - Rett Syndrome
- National Institute of Mental Health (NIMH): www.nimh.nih.gov/health/index.shtml; click on Autism Spectrum Disorders in left column
- NIMH clinical trials on ASD: www.nimh.nih.gov/trials/autism-spectrum-disorders-pervasive-developmental-disorders.shtml
- Interagency Autism Coordinating Committee’s future research: www.iacc.hhs.gov/. The IACC is made up of representatives of federal agencies and members of the public and coordinates ASD efforts within the U.S. Department of Health and Human Services.

Understanding Alcohol Use Across Your

Lifespan

Alcohol use and the risk for alcohol-related problems change over a person's lifespan. Understanding how alcohol affects people across different life stages is important in diagnosing, treating, and preventing alcohol abuse, according to research from the NIH's National Institute on Alcohol Abuse and Alcoholism (NIAAA).

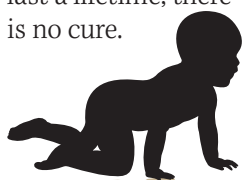
Up to one in 100 children in the United States is born with Fetal Alcohol Spectrum Disorders (FASD). This is a group of behavior and developmental conditions, one or more of which can occur when a woman consumes alcohol while pregnant. Fetal alcohol syndrome is the most serious type of FASD. It results in babies who have abnormal facial features (wide-set, narrow eyes), growth problems, and nervous system problems. FASDs last a lifetime; there is no cure.

During adolescence—the period between 12 and 17 years of age—the brain continues to develop and mature. Studies suggest that consuming alcohol during this time may have lasting effects on brain development.

Young adulthood—the period between 18 and 29—is a time of increased risk for problems with alcohol. The youngest segment of this group, although legally not allowed to drink, is most at risk for alcohol abuse, compared with other age groups.

Midlife spans the ages of 30 to 59. This is a period when the results of heavy drinking often become evident—alcoholic liver disease, several types of cancer, and disorders of the heart, circulatory system, brain, and immune system.

Senior adults tend to drink less than other age groups. But as people live longer, that may be changing. Seniors' greater use of prescription drugs also may put them at a higher risk for interaction with alcohol.



Alcohol Use Disorders

Alcohol use disorders are medical conditions. Doctors diagnose them when a patient's drinking causes distress or harm. In the United States, about 18 million people have an alcohol use disorder. The disorders are classified as either alcohol dependence (alcoholism) or alcohol abuse.

Alcoholism, the more serious of the disorders, is a disease that includes symptoms such as:

- **Craving**—A strong need, or urge, to drink.
- **Loss of control**—Not being able to stop drinking once drinking has begun.
- **Physical dependence**—Withdrawal symptoms, such

People who are alcoholic often will spend a great deal of their time drinking, making sure they can get alcohol, and recovering from alcohol's effects, often at the expense of other activities and responsibilities.

Although people who abuse alcohol are not physically dependent, they still have a serious disorder. They may not fulfill responsibilities at home, work, or school because of their drinking. They may also put themselves in dangerous situations (like driving under the influence) or have legal or social problems (such as arrests or arguments with family members) due to their drinking.

Like many other diseases, alcoholism is usually considered chronic, meaning that it lasts a person's lifetime. However, we continue to learn more and more about alcohol abuse and alcoholism, and what we're learning is changing our perceptions of the disease.

For instance, data from NIAAA's National Epidemiological Study on Alcohol and Related Conditions has shown that more than 70 percent of people who develop alcohol dependence have a single episode that lasts on average 3 or 4 years. Data from the same survey also show that many people who seek formal treatment are able to remain alcohol free, and many others recover without formal treatment.

However severe the problem may or may not seem, many people with an alcohol use disorder can benefit from treatment. Treatment options

as nausea, sweating, shakiness, and anxiety after stopping drinking.

- **Tolerance**—The need to drink greater amounts of alcohol to feel the same effect.

include prescription medications, behavioral therapy, and social support. Talk with your doctor to determine the best course of action for you, or see www.rethinkingdrinking.niaaa.nih.gov/ToolsResources/Resources.asp#Pro for resources.



Fast Facts!

- ✓ Alcohol dependence and problem use is one of the 10 leading causes of death and disability worldwide.
- ✓ Alcohol problems cost the nation an estimated \$235 billion annually.
- ✓ One in four children grows up in a household where alcohol is a problem.
- ✓ Approximately 18 million people in the U.S. suffer from alcohol abuse or dependence.
- ✓ Individuals with alcohol use disorders (AUDs) who enter treatment are four times more likely to stop drinking. But less than one quarter of those with AUDs actually receives treatment or participates in mutual or self-help groups.
- ✓ Excessive and/or chronic alcohol use may result in medical conditions such as liver and heart disease, pancreatitis, short and/or long-term harm to the brain, and esophageal and liver cancer.
- ✓ Alcohol is the substance of choice among adolescents and is used by far more young people than tobacco or marijuana; early alcohol use is associated with future alcohol dependence.

Alcohol use by adults in the United States*

Illustration: KramesStaywell



NIAAA guidelines for low-risk drinking for alcohol use disorders call for men to drink no more than four drinks in a day and no more than 14 drinks per week. For women, the guidelines are three or fewer drinks per day and no more than seven drinks per week.

Research Findings

Heavy drinking during pregnancy disrupts proper brain development in children and adolescents years after they were exposed to alcohol in the womb. That is according to a study supported by the NIH's National Institute on Alcohol Abuse and Alcoholism (NIAAA). The study is the first to track children over several years using brain imaging technology (MRI) to examine how heavy exposure to alcohol when still in the womb affects brain growth over time. According to Ken R. Warren, Ph.D., acting director of NIAAA, "It

underscores that heavy drinking during pregnancy often has lasting consequences for a child's growth and development, and reminds us that women who are, who may be, or who are trying to become pregnant, should not drink alcohol."

Physicians often fail to counsel their young adult patients about excessive alcohol use, according to a study supported by the NIAAA. "Two-thirds of the people surveyed had been seen by a doctor in the past year," says Ralph Hingson, Sc.D., director of NIAAA's division of epidemiology

and prevention research. "However, only 34 percent of young adults between ages 18 and 25 were asked about drinking by their doctors."

Studies have shown that screening and counseling by health care providers—asking patients about alcohol use and advising them to reduce risky drinking—can promote significant, lasting reductions in drinking levels and alcohol-related problems. *Remember, "low risk" doesn't mean "no risk."*

To Find Out More

NIAAA and MedlinePlus have many research-based information resources to help the public better understand alcohol use and abuse.

- MedlinePlus www.medlineplus.gov Type "alcohol" into the Search MedlinePlus box
- Rethinking Drinking—web site and downloadable booklet www.rethinkingdrinking.niaaa.nih.gov/default.asp
- Fetal alcohol spectrum disorders web page www.niaaa.nih.gov/research/major-initiatives/fetal-alcohol-spectrum-disorders
- Spectrum e-zine story: Underage drinking: One step forward, many more to go www.spectrum.niaaa.nih.gov/archives/v4i1Feb2012/features/UnderageDrinking.html
- Focus on Young Adult drinking pubs.niaaa.nih.gov/publications/arh284/toc28-4.htm
- Use and Misuse of alcohol among older women pubs.niaaa.nih.gov/publications/arh26-4/308-315.htm
- Older adults and alcohol problems pubs.niaaa.nih.gov/publications/Social/Module10COlderAdults/Module10C.html

Tips You Can Try to Reduce Alcohol Consumption

Small changes can make a big difference in reducing your chances of having alcohol-related problems. If you have tried cutting down but haven't made progress after 2 to 3 months, consider quitting drinking altogether, seeking professional help, or both.

Here are some strategies to try, or you can create your own. Check off perhaps two or three to try in the next week or two.

- **Keep track.** Keep track of how much you drink. Find a way that works for you, carry drinking tracker cards in your wallet, make check marks on a kitchen calendar, or enter notes in a mobile phone notepad or personal digital assistant. Making note of each drink before you drink it may help you slow down when needed.
- **Count and measure.** Know the standard drink sizes so you can count your drinks accurately. Measure drinks at home. Away from home, it can be hard to keep track, especially with mixed drinks, and at times, you may be getting more alcohol than you think. With wine, you may need to ask the host or server not to "top off" a partially filled glass.
- **Set goals.** Decide how many days a week you want to drink and how many drinks you'll have on those days. It's a good idea to have some days when you don't drink. People who drink with the lowest rates of alcohol use disorders stay within the low-risk limits.
- **Pace and space.** When you do drink, pace yourself. Sip slowly. Have no more than one drink with alcohol per hour. Have "drink spacers"—make every other drink a non-alcoholic one, such as water, soda, or juice.
- **Include food.** Don't drink on an empty stomach. Eat some food so the alcohol will be absorbed into your system more slowly.
- **Find alternatives.** If drinking has occupied a lot of your time, then fill free time by developing new, healthy activities, hobbies, and relationships, or renewing ones you've missed. If you have counted on alcohol to be more comfortable in social situations, manage moods, or cope with problems, then seek other, healthy ways to deal with those areas of your life.
- **Avoid "triggers."** What triggers your urge to drink? If certain people or places make you drink even when you don't want to, try to avoid them. If certain activities, times of day, or feelings trigger the urge, plan something else to do instead of drinking. If drinking at home is a problem, keep little or no alcohol there.
- **Plan to handle urges.** When you cannot avoid a trigger and an urge hits, consider these options: Remind yourself of your reasons for changing (it can help to carry them in writing or store them in an electronic message you can access easily). Or talk things through with someone you trust. Or get involved with a healthy, distracting activity, such as physical exercise or a hobby that doesn't involve drinking. Or, instead of fighting the feeling, accept it and ride it out without giving in, knowing that it will soon crest like a wave and pass. Also, see the short module to help you handle urges to drink.
- **Know your "no."** You're likely to be offered a drink at times when you don't want one. Have a polite, convincing "no, thanks" ready. The faster you can say no to these offers, the less likely you are to give in. If you hesitate, it allows you time to think of excuses to go along. **MP**

Source: *Rethinking Drinking*, NIAAA



Alcohol Use and Older Adults—NIHSeniorHealth Videos

Several free videos are available to the public on alcohol use and older adults.

Visit www.nihseniorhealth.gov/videolist.html#alcoholuse.



Photo: GE Healthcare

▲ With a one-hand user interface, Vscan provides portability along with impressive color Doppler blood flow displays.

A handheld ultrasound imaging device, the development of which was largely funded by the National Institute of Biomedical Imaging and Bioengineering (NIBIB), is helping to dramatically improve patient care all over the world.

New NIH-Funded Ultrasound Technology Is Changing Lives Around the World

From the largest U.S. hospitals to clinics in rural India to medical centers across the nation and around the world, health professionals are turning to the Vscan, a palm-sized ultrasound imaging device. The handheld unit increases access to high-quality medical images.

Vscan uses advanced technology to produce high-quality images of internal organs. It displays real-time movement and color Doppler, which produces color-coded images of blood flow that are overlaid on the black-and-white anatomical images produced by the device. This allows physicians to more quickly identify blood flow problems or heart problems. The small, sophisticated device can be used at the bedside, in an ambulance, or in remote areas that are underserved by medical personnel.

While a patient is being examined, a doctor or other health professional can quickly and non-invasively view inside the body. The ultrasound images can display organ anatomy and functions, as well as check for normal blood flow or blockages, monitor pregnancies, and much more.

“This handheld device allows non-invasive imaging at the point of care at a cost that is 20 times lower than that of traditional large mainframe ultrasound machines,” says Roderic I. Pettigrew, Ph.D., M.D., director of NIBIB, which funded the initial research on which the Vscan is based. “That can be in a large medical center, in a small hospital, in a rural community, or in low-resource settings anywhere around the globe.”

Ultrasound scanners were not always portable, or cheap. Dr. Kai Thomenius, Ph.D., Chief Technologist at GE Global Research, led the development of the Vscan technology. He had worked on miniaturizing traditional scanners years ago, taking “a typical ultrasound scanner—which is roughly



Photo: GE Healthcare

▲ At the 2010 Olympic Games in Vancouver, health professionals used handheld Vscans to check the athletes and others.

washing-machine size—and getting it down to desktop size,” he says. “We then had some ambitious plans to further miniaturize, which happened to fit perfectly with a major initiative of NIBIB’s. So, the timing was perfect to pursue it with them.”

General Electric (GE) Healthcare then further refined and brought Vscan to the market. It has now been tested in many places around the world. In 2012, GE Healthcare partnered with the American Society of Echocardiography (ASE) on a project to bring free heart echocardiograms to a rural community in northwest India. More than a thousand people suspected of having heart problems were diagnosed with ultrasound imaging using the Vscan. The ultrasound images were then uploaded to the Internet, so that health professionals in India and around the globe could see them. The unit is now being used in more than 100 countries.

The battery for the Vscan has a long charge life, so a health professional can easily image and diagnose many patients with the handheld device before it needs to be recharged.

“Since the NIBIB-funded work, we have focused on applying these devices,” says Dr. Thomenius. “The new targets are primary care doctors, anesthesiologists, interventionalists, and emergency room doctors. NIBIB support proved to be invaluable to setting the stage for further expansion of medical ultrasound into new areas.” **MP**

Find Out More

- National Institute of Biomedical Imaging and Bioengineering (NIBIB): See a video about the NIBIB-developed Vscan ultrasound technology: www.youtube.com/watch?v=6n8xZECzEck&feature=relmfu
- GE Healthcare: A quick look at Vscan: www.vscan.gehealthcare.com/gallery/a-quick-look-at-vscan

Biggest Loser Study Shows Diet Plus Exercise Pays Off

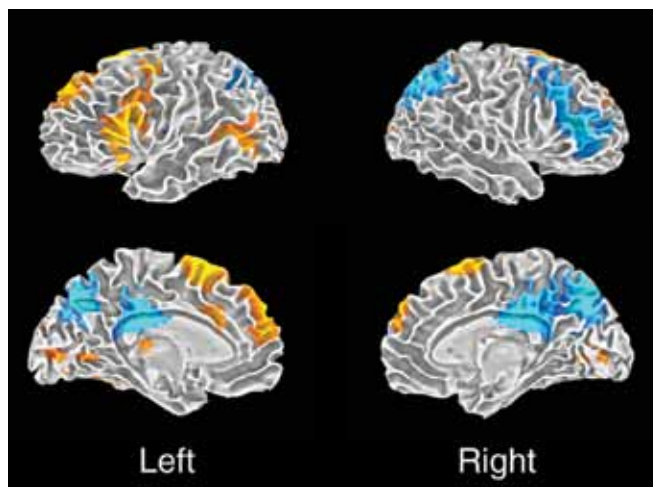
According to a study of people on the *Biggest Loser* television show, healthy eating plus regular exercise is better than just dieting. Results indicate that diet combined with exercise reduces body fat and preserves muscle, which helps maintain strength and mobility. The study also suggests that, compared to the aggressive diet and exercise plan depicted on the show, a relatively modest 20 minutes of daily vigorous coupled with a 20 percent caloric restriction can maintain the substantial weight loss achieved by the show's participants. Dr. Kevin Hall from NIH's National Institute of Diabetes and Digestive and Kidney Diseases conducted the study.

Get Moving, Live Longer

How do you spend your leisure time? New research shows that adults who do some type of physical activity in their leisure time can add as many as 4.5 years to their life. Researchers looked at data on 650,000 people, most of them aged 40 or older. Even a little physical activity added years to the lives of people whether they were normal weight, overweight, or obese. For example, people who did the equivalent of 75 minutes of brisk walking a week added 1.8 years to their life. The equivalent of 150 minutes of brisk walking added 3.4 years. Researchers with NIH's National Cancer Institute conducted the study.

This is Your Brain on Freestyle Rap

Some rap artists recently helped scientists see what happens in the brain during the creative process. The rappers performed while inside a machine used to image the brain. First the rappers performed lyrics they'd memorized. Then they were asked to "freestyle," which means they improvised lyrics with the music. The scientists



▲When rap artists are improvising, the part of the brain responsible for thought and action becomes more active (yellow); when they perform memorized lyrics, less action is observed (blue).

noticed that during freestyle rapping, the part of the brain responsible for thought and action becomes more active, while the part responsible for self-monitoring becomes less active. These shifts in the brain may help people freely express their thoughts. Researchers with NIH's National Institute on Deafness and Other Communication Disorders (NIDCD) did the study. The rappers who helped them are from the Baltimore and Washington, DC, area.

Women and Migraines

Women who get migraines are more likely to develop brain lesions than women who don't have those horrible headaches. But the lesions do not affect memory or thinking over time. The lesions are small changes in the brain that show up as bright spots during a type of imaging known as MRI. "The fact that there's no evidence of cognitive loss among these women is good news," says Linda Porter, Ph.D. Porter is an advisor with NIH's National Institute of Neurological Disorders and Stroke, which funded the nine-year study. More research is needed to figure out what causes the lesions.

Alcohol and Pregnancy: The Long-Term Consequences

Now, there's more evidence of the dangers of heavy drinking while pregnant. New research shows that children whose mothers drank while pregnant had different brain development patterns than children whose mothers didn't drink. The study is the first to follow children over several years using brain imaging technology (MRI) to look at how heavy alcohol exposure before birth interferes with brain growth in childhood and adolescence.

"It underscores that heavy drinking during pregnancy often has lasting consequences for the child's growth and development, and reminds us that women who are, who may be, or who are trying to become pregnant should not drink," says Kenneth R. Warren, Ph.D., of NIH's National Institute on Alcohol Abuse and Alcoholism.

Photo: National Institute on Deafness and Other Communication Disorders

Info to Know

NIH Quickfinder

For more information or to contact any of the following NIH institutes, centers, and offices directly, please call or go online as noted below:

Institutes

- **National Library of Medicine (NLM)**
www.nlm.nih.gov
1-888-FIND-NLM (1-888-346-3656)
- **National Cancer Institute (NCI)** www.cancer.gov
1-800-4-CANCER (1-800-422-6237)
- **National Eye Institute (NEI)** www.nei.nih.gov
(301) 496-5248
- **National Heart, Lung, and Blood Institute (NHLBI)**
www.nhlbi.nih.gov (301) 592-8573
- **National Human Genome Research Institute (NHGRI)** www.genome.gov (301) 402-0911
- **National Institute on Aging (NIA)** www.nia.nih.gov
Aging information 1-800-222-2225
Alzheimer's information 1-800-438-4380
- **National Institute on Alcohol Abuse and Alcoholism (NIAAA)** www.niaaa.nih.gov
(301) 443-3860
- **National Institute of Allergy and Infectious Diseases (NIAID)** www.niaid.nih.gov
(301) 496-5717
- **National Institute of Arthritis and Musculoskeletal and Skin Diseases** www.niams.nih.gov
1-877-22NIAMS (1-877-226-4267)
- **National Institute of Biomedical Imaging and Bioengineering (NIBIB)** www.nibib.nih.gov
(301) 451-6772
- **Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)**
www.nichd.nih.gov 1-800-370-2943
- **National Institute on Deafness and Other Communication Disorders (NIDCD)**
www.nidcd.nih.gov 1-800-241-1044 (voice)
1-800-241-1055 (TTY)
- **National Institute of Dental and Craniofacial Research (NIDCR)** www.nidcr.nih.gov
(301) 480-4098
- **National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)** www.niddk.nih.gov
Diabetes 1-800-860-8747
Digestive disorders 1-800-891-5389
Overweight and obesity 1-877-946-4627
Kidney and urologic diseases 1-800-891-5390

- **National Institute on Drug Abuse (NIDA)**
www.nida.nih.gov (301) 443-1124
- **National Institute of Environmental Health Sciences (NIEHS)** www.niehs.nih.gov
(919) 541-3345
- **National Institute of General Medical Sciences (NIGMS)** www.nigms.nih.gov
(301) 496-7301
- **National Institute of Mental Health (NIMH)**
www.nimh.nih.gov 1-866-615-6464
- **National Institute on Minority Health and Health Disparities (NIMHD)** www.nimhd.nih.gov
(301) 402-1366
- **National Institute of Neurological Disorders and Stroke (NINDS)** www.ninds.nih.gov
1-800-352-9424
- **National Institute of Nursing Research (NINR)**
www.ninr.nih.gov (301) 496-0207

Centers & Offices

- **Fogarty International Center (FIC)**
www.fic.nih.gov (301) 402-8614
- **National Center for Complementary and Alternative Medicine (NCCAM)**
www.nccam.nih.gov 1-888-644-6226
- **National Center for Advancing Translational Research (NCATS)**
www.ncats.nih.gov (301) 435-0888
- **NIH Clinical Center (CC)**
www.cc.nih.gov (301) 496-2563
- **Office of AIDS Research (OAR)**
<http://www.oar.nih.gov> (301) 496-0357
- **Office of Behavioral and Social Sciences Research (OBSSR)**
<http://obssr.od.nih.gov> (301) 402-1146
- **Office of Rare Diseases Research (ORDR)**
<http://rarediseases.info.nih.gov>
Genetic and Rare Disease Information Center
1-888-205-2311
- **Office of Research on Women's Health (ORWH)**
<http://orwh.od.nih.gov> (301) 402-1770

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What if the tools you need to quit smoking were as easy to find as a cigarette?

NCI QuitPal is a **free, interactive app** for iPhone or iPad that uses proven quit strategies and tools to help you change behavior and give up smoking.



The National Cancer Institute, National Institutes of Health, developed NCI QuitPal to help smokers working to become smoke-free. The app contains more than 10 interactive features that allow users to set a quit date and financial goals, and receive reminders. NCI QuitPal also

- Tracks daily smoking habits with an easy-to-use calendar,
- Includes motivational reminders that coincide with progress,
- Sends health milestones and craving tips,
- Allows users to connect with social networks and view personalized video messages from loved ones, and
- Makes it easy to access NCI's Cancer Information Service for free by phone or live chat.

Search "NCI QuitPal" on the App Store to download for free or visit www.smokefree.gov/apps/nciquitpal

For additional resources to help you or someone you know quit smoking, visit smokefree.gov