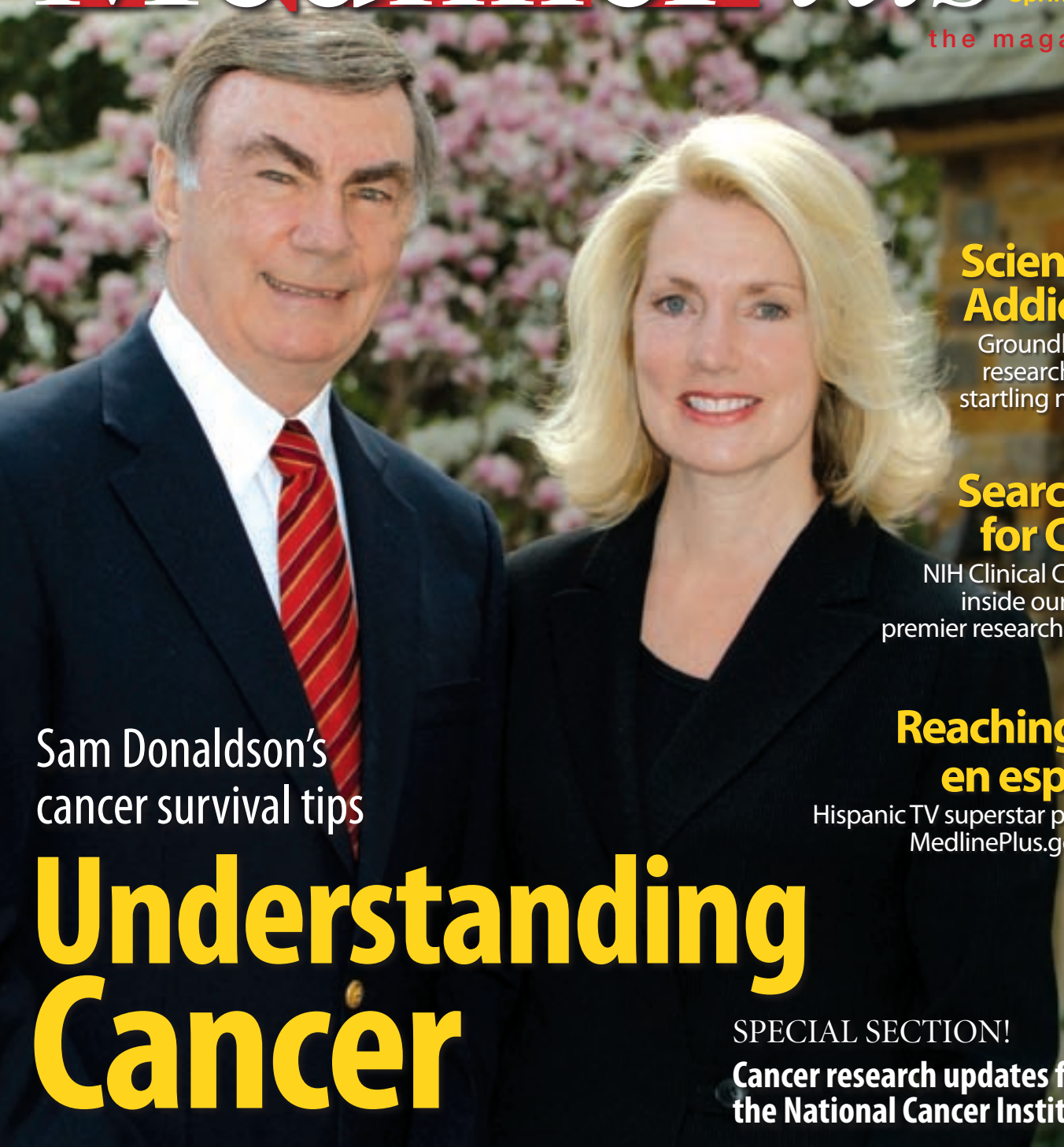


# NIH MedlinePlus

Trusted Health Information  
from the National  
Institutes of Health

Spring 2007

the magazine



Sam Donaldson's  
cancer survival tips

# Understanding Cancer

## The Science of Addiction

Groundbreaking  
research offers a  
startling new view

## Searching for Cures

NIH Clinical Center —  
inside our nation's  
premier research hospital

## Reaching out en español

Hispanic TV superstar promotes  
[MedlinePlus.gov/salud](http://MedlinePlus.gov/salud)

SPECIAL SECTION!

Cancer research updates from  
the National Cancer Institute

# Honoring Pioneers in Breast Cancer Research

In this issue of *NIH MedlinePlus* magazine, we are especially pleased to tell you about some of the wonderful and groundbreaking work that the National Institutes of Health (NIH) and its National Cancer Institute (NCI) are doing in the fight against cancer.

There are thousands of cancer researchers around the world who benefit from NIH funding. That impact is reflected in the fact that this year marks the 70th anniversary of NCI's leadership in our nation's battle against cancer in all its forms. You can read more about this in the special section starting on page 4.

We are also delighted that the annual Friends of the National Library of Medicine (FNLM) Fundraising Dinner, held on May 8 at the National Museum of Women in the Arts in Washington, DC, was able to honor two of America's preeminent breast cancer research pioneers. Receiving the Distinguished Medical Service Awards this year at the dinner were Bernard Fisher, M.D., from the University of Pittsburgh, and Dennis Slamon, M.D., from the University of California at Los Angeles.

As you will read in this issue's special section on cancer, Drs. Fisher and Slamon have spent decades helping to improve and refine our understanding of breast cancer — how it spreads, what treatments are best, and how to attack its molecular structures.

Cancer has been in the news a great deal in the last few months, and that has helped to heighten the interest of all Americans in this deadly disease. This underscores the need to make sure that our national health agenda includes sufficient funding to support research by cancer scientists around the world through continued NIH funding.

Thank you for your interest in *NIH MedlinePlus* magazine. We encourage you to join the FNLM and to support its work to promote the National Library of Medicine and NIH.

Sincerely,  
Paul G. Rogers  
Chairman  
Friends of the National Library of Medicine



Bill Branson, NIH

(left to right) Dr. Dennis Slamon, Paul G. Rogers, and Dr. Bernard Fisher at the annual Friends of the National Library of Medicine Fundraising Dinner in May. Drs. Slamon and Fisher each received the Distinguished Medical Service Award for their pioneering breast cancer research.

## How You Can Help the Library Extend Medical Knowledge

You can be a part of the Friends' mission to help educate the health, corporate, and public communities about NIH's many vital research initiatives.

If you or your company can help to support and expand the Library's efforts by providing sponsorship and other charitable donations for *NIH MedlinePlus* magazine's publication and distribution, many more thousands of Americans will gain valuable, free access to the world's

best online medical library, [www.medlineplus.gov](http://www.medlineplus.gov).

For more information, please visit [www.fnlm.org](http://www.fnlm.org) or call (202) 719-8094. Written correspondence may be sent to FNLM, 2801 M Street NW, Washington, DC 20007.

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Cover photo: ABC News journalist Sam Donaldson and his wife,  
television reporter Jan Smith, outside their McLean, Va., home. Both  
are active supporters of cancer research. Cover photo: Bill Branson, NIH



# Surfing the Web for Health Information

## Some tips from the Director of NIH

When it comes to gathering health information, it's all about trust. Not long ago, most of us turned to trusted physicians, friends, or family members with medical concerns. But a new trend is emerging today. The Internet is fast becoming the first source of health information for many people nationwide. On a typical day, about 8 million Americans go online to learn more about medical issues.

With just a few keystrokes, we now have access to more health and medical information than in any other time in history. This information can be empowering. More people are talking with their doctors about health issues they've read about online. Reliable medical information can help you become a more active participant in your own health care, so you can work with your doctor to make informed decisions that protect your health.

Unfortunately, not all information on the Internet is reliable. Some Web sites post inaccurate or biased medical information. Others are not up to date. Anyone can post health information to the Web — medical professionals and non-experts alike.

### Consider the Source

Choosing which Web sites to trust can be a challenge, but I can offer some guidelines. When you first visit any Web site, consider the source. As a general rule, Web sites sponsored by Federal government agencies are reliable starting points.

One trusted Federal organization is the National Institutes of Health (NIH), the nation's leading medical research agency. On the NIH Web site you can find a wealth of health information that's easy to read, based on the latest medical research, and reviewed by top scientists for accuracy.

You can begin your online search for medical information by visiting the NIH Health Information page (<http://health.nih.gov>), which provides links to a broad variety of credible, NIH consumer health publications. Next, visit the NIH MedlinePlus site ([www.medlineplus.gov](http://www.medlineplus.gov)), where you can expand your search to trusted resources beyond NIH. MedlinePlus was created by the National Library of Medicine, the world's premier medical library,

to give you easy access to authoritative health information from across the World Wide Web.

### Searching for Reliable Results

Most Internet users first visit a search engine — like Google or Yahoo! — when seeking health information. If you enter medical terms like “cancer” or “diabetes” into a search engine, the top-ten results will likely include authoritative nonbiased sites alongside commercial sites and those with non-expert opinions. To help you make smart choices when seeking online health information, I encourage you to visit the MedlinePlus page on healthy Web surfing at [www.nlm.nih.gov/medlineplus/healthywebsurfing.html](http://www.nlm.nih.gov/medlineplus/healthywebsurfing.html). There you will find helpful suggestions for evaluating the quality of health information you find on the Web.

In an ideal world, the most reliable sources would appear at the top of search engine results. That is a goal that we at NIH are working toward. One of the world's most advanced search engines recently approached NIH to create a partnership that would give NIH a stronger presence in search results. Search engine representatives recognize that Federal agencies, like NIH, offer some of the most accurate and unbiased information on the Internet. Making this health information easier to find is a win-win situation for search engines and Federal agencies. Even more important, the general public will have easier access to trustworthy health information.

Take advantage of the valuable medical information on the Web, but be selective in what you read and believe. Always remember to talk with your doctor about health-related issues and decisions.

*Elias A. Zerhouni, M.D.  
Director of the National Institutes of Health*



NIH Director Elias A. Zerhouni, M.D., leads the nation's medical research agency and oversees the NIH's 27 Institutes and Centers and more than 17,000 employees.



# Celebrities Gather to Fight Heart Disease

Participants in this year's NHLBI The Heart Truth campaign, highlighted by the Red Dress Collection Fashion Show in New York City in early February, included (from left to right) Kimberly Guilfoyle Villency, Kim Cattrall, Katharine McPhee, Sheila Johnson, Danica Patrick, Angela Bassett, Mae Jemison, Lauren Hutton, Phylicia Rashad, Paula Zahn, Marlee Matlin, Zuleyka Rivera, Natalie Morales, Helena Christensen, Betsey Johnson, Kelly Ripa, Kristin Chenoweth, Billie Jean King, Jane Krakowski, Rachael Ray, and Mary Hart.

## Red Dress Campaign marks steady progress

The number of heart disease deaths in American women is decreasing, according to recent research by NIH's National Heart, Lung, and Blood Institute (NHLBI). Newly analyzed data show that the number of women who die from heart disease has shifted from 1 in 3 women to 1 in 4 — a decrease of nearly 17,000 deaths from 2003 to 2004. Cardiovascular disease, the leading cause of death for men and women in the United States, kills nearly 500,000 women each year.

NHLBI, through *The Heart Truth* campaign, continued its awareness efforts by returning to New York Fashion Week the first week in February for the fifth year, with its signature platform — the Red Dress Collection Fashion Show.

"We have much to celebrate with the release of this data. It is very good news indeed," says Elizabeth G. Nabel, M.D., director of NHLBI. "To see such a significant reduction in deaths underscores that the efforts of many individuals and organizations to raise awareness, improve treatment and access, and inspire women to take action are truly saving lives." ■

## Get Involved!

Here's how you and/or your organization can help organize and promote the Red Dress Campaign and its National Wear Red Day next year — February 1, 2008.

- **Use a Heart Truth Speaker's Kit** to offer community education programs on women's heart disease.
- **Organize heart-health screening events and health fairs** at businesses, faith-based organizations, hospitals, clinics, and health centers and distribute Heart Truth materials.
- **Plan a "Wear a Red Dress Day"** for your place of worship. You can put a notice in the bulletin, hold an educational session using the Speaker's Kit and distribute Heart Truth brochures and fact sheets.
- **Ask your local library** to set up a special heart health exhibit or organize a special reading center focused on women and heart disease.
- **Partner with local large businesses and corporations** in your community or state to promote heart health awareness in the workplace.
- **Request that your state or community government** launch The Heart Truth campaign and celebrate National Wear Red Day
- **For more information about The Heart Truth**, including an online toolkit to help you plan activities, campaign materials, Red Dress pin, and a registry to submit your women's heart health activities, visit the campaign Web pages at [www.hearttruth.gov](http://www.hearttruth.gov).

PREVENTION, DETECTION, TREATMENT, CONTROL

# Understanding Cancer

## NCI: 70 Years of Excellence in Cancer Research



John E. Niederhuber, M.D.

### Welcome to this special section on cancer research and treatment.

August 5 of this year marks the 70th anniversary of the National Cancer Institute Act. This landmark legislation led to the creation of what has become the world's preeminent cancer research organization, the National Cancer Institute (NCI).

Our nation has made great progress in reducing the burden of cancer since that date and since the later passage of the National Cancer Act in 1971. For example, consider this statistic, reported in February 2006: Fewer people died of cancer in the United States in 2003 than in 2002. This was the first decrease in cancer deaths since 1930, the year our country began compiling statistics on the disease's toll. In January 2007, a second decrease in cancer deaths was reported, with fewer people dying of the disease in 2004 than in 2003.

Today's continuing progress against cancer is the result of enhanced prevention strategies, earlier detection, and better

treatment — much of it made possible by years of dedicated research here at NCI as well as research funded by NCI at hospitals, universities, and clinical centers throughout the United States and around the world. While we have much more to learn about this complex disease, our increased understanding of cancer at the genetic, molecular, and cellular levels is opening up enormous opportunities to interrupt the initiation and development of the disease.

As you will read in the following pages, there are tremendous efforts being made to prevent and treat all forms of cancer, and there is good news to report concerning survivorship rates now and in the future. We hope that you find the information in this special section useful, and that you will visit the NCI Web site ([www.cancer.gov](http://www.cancer.gov)) and MedlinePlus ([www.medlineplus.gov](http://www.medlineplus.gov)) for even more cancer research information.

John E. Niederhuber, M.D.  
Director, National Cancer Institute

# Cancer Today

In recent months, cancer has made headlines in the national news. High-profile cancer cases, such as the recurrence and spread (metastasis) of breast cancer in Elizabeth Edwards, wife of presidential candidate John Edwards, and the recurrence and spread of colon cancer in Tony Snow, White House Press Secretary, have helped to spur both public and media interest. Television specials and newsmagazine cover stories have helped show Americans how far we have come in the prevention and treatment of various cancers and how far we still must go to end their devastating effects. Much of that progress has been fueled by research funded by the National Institutes of Health (NIH) and, in particular, NCI.

More than 1.5 million new cases of cancer are expected to be diagnosed in 2007. The more important news, however, is that survival rates for all cancers diagnosed between 1996 and 2002 is 66 percent, an improvement compared to the 1975–1977 rate (51 percent). This improvement in survival reflects significant progress in earlier diagnosis and advances in treatment.

An additional cause for optimism is the scientific evidence suggesting that approximately two-thirds of cancer deaths can potentially be prevented. Cancer deaths related to tobacco use, obesity, physical inactivity, nutrition, sun exposure, and even exposure to infectious agents, such as hepatitis B, human papillomavirus, or helicobacter pylori (a bacterium that infects the stomach), could be prevented through changes in behavior, vaccines, or the use of antibiotics.

The National Cancer Institute is involved with research on all forms of cancer around the world.

“NCI supports over 1,300 clinical trials a year, assisting more than 200,000 patients,” says NCI’s Dr. Niederhuber. “And much of that work is carried out in our extramural research program — research that is conducted outside NCI in clinical settings all over the United States and in various parts of the world — totaling more than \$2.1 billion this year.”

The extramural research program reaches nearly 650 universities, hospitals, cancer centers, and other sites in the United States and in more than 20 other countries. Approximately 85 percent of NCI’s budget funds extramural research.

## 2007 Estimated Numbers of New Cancer Cases and Deaths for Six Common Cancer Types

Cancer Type	Estimated New Cases	Estimated Deaths
Lung	213,380	160,390
Breast (Female – Male)	178,480 – 2,030	40,460 – 450
Prostate	218,890	27,050
Colon and Rectal (Combined)	153,760	52,180
Melanoma (Skin Cancer)	59,940	8,110
Gynecologic (Cervical, Endometrial, Ovarian)	72,660	26,350

Source: American Cancer Society: *Cancer Facts and Figures 2007*: NCI

## Cancer Screening Tests

Screening tests can find diseases and conditions early when they are easier to treat. Talk to your doctor about which of the tests are right for you and when you should have them.

- **Colorectal Cancer Tests:** Have a test for colorectal cancer starting at age 50. Your doctor can help you decide which test is right for you.
- **Breast Cancer (Women):** Have a mammogram every 1 to 2 years starting at age 40.
- **Cervical Cancer (Women):** Have a Pap smear every 1 to 3 years if you have been sexually active or are older than 21.
- **Prostate Cancer Screening (Men):** Get advice from your doctor if you are considering having a prostate-specific antigen (PSA) test or digital rectal examination (DRE).
- **Skin Cancer Screening:** Ask your doctor to check moles, birthmarks, and skin pigmentation for signs of melanoma, especially if you have fair skin, a history of sun exposure, or a history of skin cancer.

Many authorities recommend that, after age 50, tests should include regular colonoscopy for cancer of the colon, serum prostatic-specific antigen (PSA) for prostate cancer, mammography for breast cancer, and enhanced lung CT imaging for lung cancer.

### NIH Resources

This special section has been created in cooperation with the National Cancer Institute (NCI), including information for the public contained in *The Nation’s Investment in Cancer Research* and *NCI Cancer Bulletin*, available at [www.cancer.gov](http://www.cancer.gov). Additional content came from *NIH News in Health* and *NIH Research Matters*, both from the NIH Office of Communications and Public Liaison. For contact information on NCI and other NIH offices and their specialized research areas, turn to page 29.

# Survivability and Hope

For many patients today, a cancer diagnosis no longer represents a death sentence. Many types of cancer are achieving the status of chronic but treatable diseases. Earlier detection and better treatments are extending the lives of cancer patients as never before.

As Julia Rowland, Ph.D., director of the NCI Office of Cancer Survivorship, and her colleagues stated in a recent research journal: “In the last three decades, cancer has been transformed from a fatal disease to one in which the majority of people diagnosed with cancer receive highly effective treatments that result in either cure or long-term survivorship.”

This message of hope is a hallmark of the latest advances in cancer research by NIH’s NCI and the many NCI-funded researchers across the nation.

That is also the message from Bernadine Healy, M.D., former head of the NIH, American Red Cross, and American Heart Association, who suffered a malignant brain tumor eight years ago. In her new book, *Living Time: Faith and Facts to Transform Your Cancer Journey*, Dr. Healy assesses the current state of cancer research and treatment from both a professional and deeply personal perspective.

“Cancer used to be viewed as a certain death sentence, and that was exactly how I viewed my prognosis on that night in 1999 [when diagnosed],” writes Dr. Healy. “But nowadays we have a new outlook on cancer, and it’s a veritable sea change ... For most on cancer’s path, it is no longer the end of life but the beginning of life’s challenging next stage.”



Dr. Bernadine Healy, cancer survivor, physician, and author, at home in Cleveland with husband Dr. Floyd D. Loop

Charlie Archambault for U.S. News & World Report

So promising is the outlook on living with cancer that there is a new concern: People who have cancer are living long enough now to develop additional tumors, new cancers, as they go forward. Dr. Rowland and her colleagues now estimate that there are 756,467 people diagnosed with more than one primary cancer across an entire lifetime in the United States.

“White women experience the highest burden of both multiple tumors, as well as single tumors,” they write. “Breast, colon and rectum, and prostate are the sites with the highest prevalence of multiple tumors.”

Dr. Rowland notes that today’s researchers and clinicians are coming to understand that survivorship brings a variety of challenges, including those caused by different cultural, racial, and sociodemographic factors. “Among the biggest challenges we have for the future,” says Dr. Rowland, “are to better understand the causes and consequences of cancer-related health disparities, and to find ways to eliminate them.”



# Sam Donaldson: Tips From a Cancer Survivor

For 40 years, Sam Donaldson has worked for ABC News, reporting from virtually every corner of the earth. Winner of many journalism and television awards, the Texas-born Donaldson is also a 10-year survivor of deadly melanoma skin cancer. His own experience with cancer and what he has learned since then, have helped to shape his view that cancer patients can work actively to fight their disease and that there is hope.

Recently, magazine coordinator Chris Klose sat down with Donaldson to get his personal experiences with skin cancer.

**Klose:** What went through your mind when you were told you had cancer?

**Sam Donaldson:** I thought I was going to die. I told my wife, “I think we have about three months.” My mother died of it at 93 and my brother of liver cancer at 49, so I understood what it was like. I had read that melanoma was a bad actor; that it was unpredictable and often could not be charted, from the standpoint of the course it might take.

**Klose:** At that point, did you try to educate yourself about cancer and what you should be doing to increase your odds?

**Sam Donaldson:** I didn’t do a lot of studying at first because, fortunately, my treatment began practically immediately. Now, of course, I have studied cancer for years, and boned up on my own specialty of the “Cancer Club, Melanoma Division.” Although I am not an oncologist, I think I know a little bit about the disease now and the survivability of various forms and stages.

**Klose:** Do you believe that more information helps emotionally?

**Sam Donaldson:** Well, I suppose it does. I tell people several things when talking about the survivors club and what we can do. First, we all want optimistic doctors. For example, Dr. Steve Rosenberg, at the National Cancer Institute, examined me, looked at the CAT scan I had had and said, “You know, I think you have a good chance to live a long, normal, healthy life.”

I blurted out, “I don’t believe you.” In looking back, I realize that he hadn’t said a “perfect chance.” He said a “good chance.” But I look at the statistics for melanoma and they have moved some, and I think it is thanks to Steve and the research he has



I thought I was going to die. I told my wife,  
“I think we have about three months.”

done on Interleukin 2, trying to find the right combination. Before 1984, the melanoma cure rate was zero percent. Today it is about 17 percent.

**Klose:** What would be your top three tips for people who have cancer?

**Sam Donaldson:** First is the emotional tip: Cancer is not an automatic death sentence. Yes, half-a-million or more Americans a year die from all forms of cancer. But the survivors club is growing.

The second point is obvious: Get a second opinion, maybe a third. Someone once said to me, “You may not get to play this hand more than once, so you want the best cards.” No offense to the experts, but we’ve all heard stories of people who have been misdiagnosed or about other doctors who had a little bit better idea of what to do. So my strong advice is to get a second opinion or even a third, so that you can make certain.

And my third tip, I guess, goes back to the first. And that is to have an optimistic view. Let me stress that, although I don’t have a medical background, I do believe that, on the margins, such things as one’s attitude may play a part in recovery versus non-recovery. I don’t think an optimistic attitude cures cancer, but I do believe that if you can concentrate on the fact that you’re going to live — not die — it helps.

These are the three tips that have helped me and could help others, too. (Read more about skin cancer research and treatment on page 12.)

# 6 Common Cancers

NCI is at the forefront of research into how doctors diagnose and treat various types of cancer, as well as what advances are being made. The following pages highlight information you should know about six of the most common cancers and some of the NCI-funded research currently under way. (In future issues, *NIH MedlinePlus* will feature research about additional forms of cancer.)

## Lung Cancer

Lung cancer causes more deaths than the next three most common cancers combined (colon, breast, and prostate). In 2007, scientists estimate that more than 213,000 people will be newly diagnosed with lung cancer, and over 160,000 people will die of the disease. Since 87 percent of lung cancers are caused by smoking, preventing people from starting to smoke and increasing the quit rate are important approaches.

### Screening and Diagnosis

There are two main types of lung cancer: **Non-small cell lung cancer (NSCLC)** is the more common type; **small cell lung cancer (SCLC)** makes up about 20 percent of all lung cancer cases.

Your doctor will perform a physical exam and ask questions about your medical history. She will ask if you smoke, and, if so, how long you have smoked. When listening to your chest with a stethoscope, your doctor can sometimes hear fluid around the lungs, which could (but doesn't always) suggest cancer. You may receive chest X-rays and possibly other chest scans. In some cases, your doctor may need to remove a piece of tissue from your lungs for examination under a microscope. This is called a biopsy.

Your symptoms may include a persistent cough, lingering bronchitis, and even coughing up blood. If lung cancer has advanced beyond the early stages and even spread (metastasized) beyond the lungs, symptoms may include weight loss, fatigue, difficulty breathing, and more severe reactions.

### Treatment

Surgery, chemotherapy, and radiation therapy are the most common forms of treatment for lung cancer. Surgery is used to cut out the entire lung or the part of the lung where the cancer is before it can spread. Chemotherapy, sometimes referred to as "chemo," is the use of strong drugs to treat cancer. There are more than 100 different chemo drugs used today to kill cancer or to slow its growth. Radiation therapy uses

special equipment to send high doses of radiation to the cancer cells to kill them. Sometimes, your doctor will use surgery, chemo, and radiation therapy in combination.

### Research: What's New

- **Targeting cancer antigens:** When your immune system recognizes a foreign invader (called an antigen), it creates an antibody to help destroy that antigen. The antigen may be part of a virus, a bacterial cell, or a cancer cell. Certain cancer cells make antigens that are not found on the vast majority of normal, healthy cells. The body may not normally make antibodies against these antigens. However, scientists can develop special types of antibodies in the laboratory called "monoclonal" antibodies. When given to patients, these monoclonal antibodies bind to the foreign antigens on the surface of cancer cells and help destroy them. Recent studies indicate this approach holds promise.
- **Bevacizumab and chemotherapy:** Last year, scientists announced a new development in treating advanced lung cancer. In a large study, people taking bevacizumab (Avastin) along with chemo lived slightly longer than those taking chemo alone.
- **Erlotinib:** Another targeted treatment — approved for lung cancer in 2004 — is erlotinib (Tarceva), which targets a protein found on cancer cells that helps them multiply. People with late-stage lung cancer who had not done well with chemotherapy received erlotinib as a single treatment. On average, those taking erlotinib found some temporary easing of symptoms.
- **National Lung Screening Trial:** One study related to earlier detection of lung cancer is the National Lung Screening Trial (NLST), a lung cancer screening trial sponsored by NCI and being conducted at more than 30 study sites in the United States. Launched in 2002, NLST is comparing two ways of detecting lung cancer: a process called spiral computed tomography (spiral CT) scanning of the chest and standard chest X-ray. NLST is trying to determine whether spiral CT helps find lung cancer better and earlier than chest X-rays.



Actress Kathryn Joosten, ex-smoker and lung cancer survivor, was the president's secretary on *The West Wing* and an Emmy winner for *Desperate Housewives*. (Photo ©2005 Kathy Hutchins / Hutchins)

# Breast Cancer

Breast cancer is a malignant (cancerous) growth that begins in the tissues of the breast. The American Cancer Society estimates that over the course of a lifetime, one in eight women will be diagnosed with breast cancer. When detected early, before the cancer has spread (called localized cancer), the 5-year survival rate for women with breast cancer is now 98 percent, compared to only 26 percent if the cancer has already spread.

## Screening and Diagnosis

All women should check their breasts for lumps or other changes in texture; this self-examination process is a key personal screening tool. Your doctor may also check each breast for lumps and look for other problems. If you have a lump, your doctor will feel its size, shape, and texture. A hard, oddly shaped lump that feels firmly attached within the breast is more likely to be cancer.

Your doctor may order a mammogram (an X-ray picture of the breast) to view the tissues inside the breast. NCI recommends that women 40 years of age and older should have a screening mammogram at least every two years. Other breast imaging tools include magnetic resonance imaging (MRI) scans for detailed pictures of breast tissue and ultrasound, which sends out sound waves that bounce off tissues to create a picture. If your doctor finds something suspicious with any of these imaging methods, you may need to have a biopsy (testing of a tiny portion of breast tissue) to look for cancer cells.

## Treatment

In recent years, two therapies have revolutionized breast cancer treatment: tamoxifen (Nolvadex) and trastuzumab (Herceptin). Bernard Fisher, M.D., of the University of Pittsburgh, and Dennis J. Slamon, M.D., of UCLA, pioneered these treatments. (See a related story on the inside front cover of this issue.)

Dr. Fisher's research into how cancer spreads paved the way for today's understanding that cancer is a disease of the entire body and that its spread is not predictable. Dr. Fisher went on to show the effectiveness of adjuvant (supportive) chemotherapy and hormonal therapy with tamoxifen in treating breast cancer. Tamoxifen blocks the activity of the female hormone estrogen in the breast and can stop the growth of some breast tumors.

Dr. Slamon and his colleagues developed trastuzumab (Herceptin). Trastuzumab, a monoclonal antibody, was the first treatment to target the specific molecular changes in cells that make them cancerous. Because it targets only the cancer cells, trastuzumab causes fewer side effects than standard chemotherapy drugs, which can kill both cancer cells and normal cells.

Today, breast-conserving surgery (lumpectomy), followed by localized radiation therapy has replaced mastectomy (removal of the entire breast) as the preferred surgical approach for treating women with early-stage breast cancer. Combination chemo (therapy with more than one drug) has also become standard in the treatment of women with early stage breast cancer.



Elizabeth Edwards, wife of presidential candidate John Edwards, does not let a recurrence of breast cancer slow her down.

AP Photo/Brett Flashnick

## Research: What's New

- **Sentinel lymph node biopsy, followed by surgery:** The sentinel lymph node is the first place where cancer is likely to spread from the tumor. A surgeon removes this node and examines it under a microscope. If there are no cancer cells, the surgeon can usually remove just the tumor and not additional lymph nodes.
- **Hormone Replacement Therapy:** Age-adjusted breast cancer incidence rates in women in the United States fell 6.7 percent in 2003, according to a recent study. At the same time, prescriptions for hormone replacement therapy (HRT) declined rapidly, following reports from NIH's Women's Health Initiative (WHI) study that showed an increased risk of breast cancer, heart disease, stroke, blood clots, and urinary incontinence among postmenopausal women who were using HRT that included estrogen and progestin. This study does not prove a link between HRT and breast cancer incidence. WHI researchers are expected to release a follow-up report later this year that should provide a much higher level of evidence about HRT and breast cancer incidence rates.
- **Aromatase inhibitors:** Dr. Matthew Ellis and Dr. John Olson of the American College of Surgeons Oncology Group and their colleagues are running clinical trials at sites throughout the United States on breast cancer that grows in response to the hormone estrogen. Women with this kind of breast cancer often benefit from treatment with drugs known as aromatase inhibitors (AIs). AIs block the ability of an enzyme called aromatase to make estrogen. The NCI-funded researchers are comparing AI therapy and chemotherapy before surgery for breast cancer. They hope to discover whether this therapy can shrink tumors enough to allow women to have breast-sparing surgery instead of mastectomy.
- **MRIs and the other breast:** When a woman is newly diagnosed with cancer in one breast, there is up to a 10 percent chance that clinical exams and mammography will miss a tumor growing in the opposite breast. For that reason, some women choose a double mastectomy rather than live with the worry that the second breast may develop cancer. A new study funded by NCI found that magnetic resonance imaging (MRI) improved the detection of cancer in the opposite breast at the time of initial diagnosis — better than through a standard mammogram.

# Prostate Cancer

The prostate gland is a walnut-sized structure that makes up part of a man's reproductive system. The cause of prostate cancer is unknown, but it is the second most common cause of death from cancer in men of all ages and is the most common cause of death from cancer in men over 75. Prostate cancer is rarely found in men younger than 40.

## Screening and Diagnosis

A yearly rectal exam by your doctor can often reveal an enlarged prostate. Symptoms of prostate cancer may include problems passing urine, such as pain, difficulty starting or stopping the stream, or dribbling; low back pain; and pain with ejaculation.

Since the development of the prostate-specific antigen (PSA) test, a prostate cancer screening method that measures the amount of PSA in a man's blood, it has become easier to spot prostate cancer early. A high PSA level has been linked to an increased chance of having prostate cancer, but does not mean that the person definitely has it. Several conditions besides cancer can cause the PSA level to rise. These include urinary tract infection, benign prostatic hypertrophy (BPH — an enlarged prostate), and prostatitis (inflammation of the prostate, often from

a bacterial infection). Since the PSA test became common, most prostate cancers are found before they cause symptoms.

Physicians now use a prostate-cancer grading formula called the Gleason system that assigns prostate cancers a score from 2 to 10. The higher your Gleason score, the more likely it is that your cancer will grow and spread quickly.



Singer Harry Belafonte has been vocal in his discussion of his prostate cancer and the need for early screening.

## Treatment

For prostate cancer that has not spread outside the prostate gland or nearby area, the most common treatment options are:

- **Watchful Waiting:** For men over 70 with a low Gleason score, the most common recommendation is to defer treatment and watch closely for signs the disease is progressing.
- **Surgery (also known as prostatectomy):** This is the surgical removal of part or all of the prostate, and other nearby areas if necessary.
- **Radiation therapy:** This is aimed at killing cancer cells, either with an external beam of radiation or by implanting tiny radioactive “seeds” in the body.

For advanced prostate cancer that has spread to other parts of the body, the most common treatment options are hormone therapy, which starves prostate cancer cells of testosterone by using drugs that inhibit testosterone production or by removing the testicles, or chemotherapy and radiation therapy.

## Research: What's New

- **Genetic markers:** The NCI launched an initiative in 2006 to identify genetic alterations that make people susceptible to prostate and breast cancer. The Cancer Genetic Markers of Susceptibility (CGEMS) project is conducting scans of the entire human genome (genotyping) to identify common, inherited gene mutations that increase the risks for these cancers. In April 2007, researchers reported that a common variation in a DNA segment strongly influences prostate cancer risk, and that this variation may be responsible for up to 20 percent of prostate cancer cases in white men in the United States.

“Discovery of this common variation is very exciting. Building on this finding we may be able to identify men at highest risk for prostate cancer, diagnose the disease earlier, and hopefully prevent it all together,” says NCI's Dr. Niederhuber. “One of the next steps is to understand the mechanism by which this genetic variation exerts its effect on cancer risk.”

- **Protein signatures:** A recent NCI-funded study showed that testing blood samples for antibodies that men make against their own prostate cancer cells (called “autoantibodies”) may help identify individuals with early stages of the disease. This might lead to a new test that could be used along with the PSA test to detect early-stage prostate cancer. This could potentially reduce the number of prostate biopsies that are done because of false-positive PSA tests.

# Colorectal Cancer

Cancer of the colon (large intestine) or rectum (end of the colon) is called colorectal cancer. In the United States, it is the third most common cancer in men and women. Caught early, it is often curable. It is more common in people over 50, and the risk increases with age. Deaths from colon cancer have fallen nearly 9 percent in the past decade. Better and earlier screening gets much of the credit, along with better treatments, but the cause of the disease is still unknown.

## Screening and Diagnosis

You are more likely to get colorectal cancer if you have polyps, growths inside the colon and rectum that may become cancerous. A family history of colon or rectal cancer puts you at higher risk, as does ulcerative colitis or Crohn's disease (also known as inflammatory bowel disease). Symptoms can include blood in the stool, narrow stools, a change in bowel habits, and general stomach discomfort. However, you may not have symptoms at first, so screening is important. Everyone who is 50 or older should be screened for colorectal cancer. The most thorough examination of the colon is done with a colonoscope, which is inserted into the rectum. A colonoscope is a thin, tube-like instrument, with a light and a lens for viewing. It may also have a tool to remove tissue (polyps) to be checked under a microscope for signs of disease.

## Treatment

Standard treatments include surgery, chemotherapy, radiation therapy, or a combination of these methods. Treatment depends partly on the stage of the cancer. At the earliest stage (stage 0), doctors may treat colon cancer with localized surgery, possibly by removing the cancer cells during a colonoscopy. For stages I, II, and III cancer, more extensive surgery is needed. With advanced colorectal cancer, your doctor will most likely prescribe chemotherapy. While radiation therapy is occasionally used in patients with colon cancer, it is usually used in combination with chemotherapy for patients with advanced rectal cancer.

White House Press Secretary Tony Snow has returned to work following surgery for a recurrence of colon cancer.

## Research: What's New

- **Combination chemotherapy:** Until recently, standard chemotherapy for colorectal cancer usually consisted of treatment with just two drugs, 5-fluorouracil (5-FU) and leucovorin. A third drug, irinotecan, was approved by the FDA in 1996 for use in combination with 5-FU and leucovorin in treating metastatic colorectal cancer (cancer that has spread to other parts of the body). Since then, the drug oxaliplatin has also been approved for use in combination with 5-FU and leucovorin to treat metastatic colorectal cancer and post-surgical treatment of this cancer. Unfortunately, traditional chemotherapy agents often affect healthy cells, in addition to cancer cells, leading to a variety of side effects.
- **Monoclonal antibodies:** Targeted monoclonal antibody therapies — bevacizumab (Avastin) and cetuximab (Erbix) — have been available since 2004. One advantage of these targeted therapies is that they usually have fewer side effects than chemo drugs. Bevacizumab targets a protein that tumors use to help them grow new blood vessels. The blood vessels let the tumors get the oxygen and nutrients they need to keep growing. Cetuximab targets a protein found on the surface of tumor cells that helps promote cell growth and multiplication. Both antibodies are approved only for people with cancer that has metastasized, and they haven't yet been shown to work in earlier stages of the disease. In addition, bevacizumab may increase the risk of heart attacks and strokes, making it unsafe for certain people.



AP Photo/Ron Edmonds

# Skin Cancer

Skin cancer is the most common form of cancer in the United States. The two most common types are basal cell carcinoma and squamous cell carcinoma (the names come from the type of cells in which the cancer begins). They usually form on the head, face, neck, hands, and arms. Another type of skin cancer, melanoma, is less common than the others, but far more dangerous — even deadly. It involves the cells that produce the skin pigment melanin, which is responsible for skin and hair color. Melanoma can spread very rapidly, and the incidence of melanoma in the United States is steadily increasing. It is the leading cause of death from skin disease.

The development of melanoma is related to sun exposure, particularly to sunburns during childhood. It is most common among people with fair skin, blue or green eyes, and red or blond hair.

## Screening and Diagnosis

Melanoma may appear on normal skin, or it may begin in a mole or other area that has changed in appearance. Some moles present at birth may develop into melanomas. The primary symptom of any skin cancer is usually a mole, sore, lump, or growth

on the skin. Any change in appearance of a pigmented skin growth over time is a warning sign. Also, watch for any bleeding from a skin growth.

The **ABCD** system may help you remember features that might be symptoms of melanoma:

- **Asymmetry:** One half of the abnormal area is different from the other half.
- **Borders:** The lesion or growth has irregular edges.
- **Color:** Color changes from one area to another, with shades of tan, brown, or black (sometimes white, red, or blue). A mixture of colors may appear within one growth.
- **Diameter:** The trouble

spot is usually (but not always) larger than 6 mm in diameter — about the size of a pencil eraser.

The key to treating melanoma is recognizing symptoms early.

You might not notice a small spot of concern if you don't look carefully, so perform thorough self-examinations on a regular basis.

## Treatment

To treat melanoma, the cancerous skin cells and a portion of the normal surrounding skin usually have to be surgically removed. You may need a procedure called surgical lymph node biopsy to check if the cancer has spread to nearby lymph nodes. If it has, these lymph nodes may also need to be removed. A skin graft may be necessary after the surgery if a large area of skin is affected.

Only the smallest and most shallow melanomas can be cured by surgery alone, so early diagnosis is very important. Radiation therapy, chemotherapy, or immunotherapy (use of medications that stimulate the immune system, such as interferon) may be recommended in addition to surgery. If the skin cancer is deeper than 4mm or the lymph nodes have cancer, there is a high risk of the cancer spreading to other tissues and organs. After surgery, treatment with interferon, a class of drugs that helps your immune system fight off the cancer, may be useful for these patients.

## Research: What's New

- **Lymphatic mapping and sentinel lymph node biopsy:** In 2006, an NCI study showed that a technique called lymphatic mapping and sentinel lymph node biopsy helped some melanoma patients live longer without a recurrence of their disease. The technique looks for cancer in the first lymph node to receive lymphatic drainage from a tumor, called the “sentinel node.” If there are cancer cells in the sentinel node, doctors completely remove all nearby lymph nodes. The study found that this technique was better than watching and waiting for evidence of lymph node metastasis before removing the nearby lymph nodes.
- **Sensitized T cells:** NCI researchers recently genetically engineered some melanoma patients' white blood cells to recognize and attack their own cancer cells. The NCI researchers, led by Steven A. Rosenberg, M.D., Ph.D., sought an effective way to convert normal white blood cells (lymphocytes) in the lab into cancer-fighting cells. To do this, they drew a small sample of blood that contained normal lymphocytes from individual patients and infected the cells with a retrovirus in the laboratory. The retrovirus acted like a carrier pigeon to deliver a gene encoding a specific protein, called a T cell receptor (TCR), into the cells. The TCR used in this study recognizes and binds to a certain molecule found on the surface of melanoma cells. When the modified lymphocytes were reintroduced into the patients' bloodstreams, they were activated to destroy melanoma cells. The research demonstrated a successful regression of advanced melanoma.



Brittany Lietz, Miss Maryland, has had two dozen surgeries for melanoma — and now spreads the word about skin cancer and the dangers of tanning and tanning beds.

AP Photo/Herald-Mail, Kevin G. Gilbert

# Gynecologic Cancers

## Cervical, Endometrial, and Ovarian

NCI estimates that endometrial, or uterine, cancer will be diagnosed in an estimated 39,080 American women this year, more than twice the number of women who will be diagnosed with cervical (lower part of the uterus) and ovarian (female reproductive glands) cancers combined. However, in terms of 2007 deaths, ovarian cancer is forecast to kill 15,280 women, while deaths caused by uterine (7,400) and cervical (3,670) cancers are fewer than half that number. That is a combined 26,350 deaths in this country this year from cancers of the female reproductive system. To avoid these cancers, it's important to understand them.

**Cervical cancer:** The cancer is caused by several types of a virus called human papillomaviruses (HPV). HPV spreads through sexual contact. Most women's bodies are able to fight this infection. But sometimes the virus leads to cancer. You're at higher risk of cervical cancer if you smoke, have many children, have many sex partners, use birth control pills for a long time, or have HIV infection.

**Endometrial cancer:** Although the exact cause of endometrial cancer is unknown, increased levels of estrogen appear to have a role. Estrogen helps stimulate the buildup of the lining of the uterus.

**Ovarian cancer:** This cancer usually occurs in women over age 50 but can affect younger women. It causes more deaths than any other cancer of the female reproductive system and is the leading cause of death from gynecologic cancer in the developed world. Its cause is unknown.

## Screening and Diagnosis

Among all three of these reproductive-system cancers, early detection is crucial. But detection can be very difficult, especially in the early stages.

**Cervical cancer:** The cancer may not cause any symptoms at first, but later, you may have pelvic pain or bleeding from the vagina. It usually takes several years for normal cells in the cervix to turn into cancer cells. A test called a Pap smear is very effective in screening for cervical cancer.

**Endometrial cancer:** A pelvic examination is frequently normal in the early stages of endometrial cancer. Changes in the size, shape, or consistency of the uterus or its surrounding, supporting structures may be seen when the disease is more advanced.

**Ovarian cancer:** The sooner ovarian cancer is found and treated, the better the chance for recovery. But ovarian cancer is hard to detect early. Many times, women with ovarian cancer have no symptoms or just mild symptoms until the disease is in an advanced stage and hard to treat. To date, there is no effective screening regimen for ovarian cancer. More than half of women with ovarian cancer have advanced-stage disease at the time of diagnosis.

## Treatment

Current treatments for all three cancers, especially in advanced stages, include surgery followed by chemotherapy or a combination of chemo and radiation therapies. The exact mix of the cancer-fighting drugs, sometimes called a "cocktail," depends on the particular form and stage of the cancer.

## Research: What's New

- **(Cervical) Combination Therapy:** There was a major advance in the treatment of cervical cancer when five NCI-sponsored clinical trials showed that patients with advanced cervical cancer who were treated with combination chemo based on the drug cisplatin, together with radiation therapy, survived significantly longer than patients who were treated with radiation therapy alone. The overall results from these trials showed that the risk of death from cervical cancer was decreased by about 30 percent — down to a 50 percent risk of death — with the use of this concurrent "chemoradiation" therapy. In light of these findings, NCI issued a clinical announcement to thousands of physicians stating that strong consideration should be given to adding chemotherapy to radiation therapy in the treatment of invasive cervical cancer.
- **(Cervical) HPV vaccine:** Another major advance in the management of cervical cancer was the FDA's approval of a vaccine designed specifically to prevent this disease. The results of several studies have shown that in women who had not already been infected, the approved HPV vaccine was nearly 100 percent effective in preventing precancerous cervical lesions, precancerous vaginal and vulvar lesions, and genital warts caused by infection with the types of human papilloma virus (HPV) targeted by the vaccine.
- **(Ovarian) Combined Treatment:** In 2006, NCI announced an advance in the treatment of advanced ovarian cancer. Based on the results of eight clinical trials, NCI encouraged doctors to use a combination of two chemo delivery methods — intravenous (by vein) and intraperitoneal (into the abdomen) — after surgery to remove as much of the ovarian cancer as possible. The combined drug-delivery approach, though it had more side effects, extended overall survival for women with advanced ovarian cancer by about a year compared to intravenous drug delivery alone.

## Cancer Tips At Your Fingertips

There is a world of free, trustworthy information about all forms of cancer through the National Institutes of Health, including the National Cancer Institute's Web site ([www.cancer.gov](http://www.cancer.gov)) and the National Library of Medicine's MedlinePlus Web site ([www.medlineplus.gov](http://www.medlineplus.gov)). From the latest research news and medical resources to information on clinical trials you might wish to join, make the NIH your one-stop online source of medical information.



# Why Can't They Just Stop?®

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# *The Science of* **Addiction** *Drugs, Brains, and Behavior*

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Two NIH institutes — the National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) — have joined with HBO to reveal startling new advances in the fight against alcohol and other drug addiction.

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**T**he personal and family tragedies related to addiction are heartrending and, quite often, desperate. The struggles to break addiction and restore lives are uniquely challenging. And the scientific breakthroughs now taking place to help understand, prevent, and successfully treat addiction are nothing short of astonishing.

Two NIH institutes that are already on the forefront of research into drug and alcohol addiction recently joined with cable TV network HBO to present an unprecedented multi-platform film, TV, and print campaign aimed at helping Americans understand addiction as a chronic but treatable brain disease. The eye-opening documentary, *Addiction*, first aired on HBO in March and is one part of the campaign. Developed with funding from the Robert Wood Johnson Foundation, *Addiction* and related video and print materials seek to help Americans understand addiction as a chronic yet treatable brain disease and spotlight promising scientific advancements.

Many Americans today do not yet understand why people become addicted to drugs or how remarkable scientific advances are literally redefining the arena of addiction, notes Nora D. Volkow, M.D., Director of the National Institute on Drug Abuse (NIDA).

“Groundbreaking discoveries about the brain have revolutionized our understanding of addiction, enabling us to respond effectively to the problem,” she says. “We now know that addiction is

a disease that affects both brain and behavior. We have identified many of the biological and environmental factors and are beginning to search for the genetic variations that contribute to the development and progression of the disease.”

With nearly one in 10 Americans over the age of 12 classified with substance abuse or dependence, addiction takes an emotional, psychological, and social toll on the country. The economic costs of substance abuse and addiction alone are estimated to exceed a half trillion dollars annually in the United States due to health care expenditures, lost productivity, and crime.



Nora Volkow, M.D., Director of the National Institute on Drug Abuse

## “Addiction is a disease — a treatable disease — and it needs to be understood.”

— Dr. Nora Volkow

“The National Institutes of Health is proud to be part of this effort to educate Americans about the nature of addiction and its devastating consequences,” says NIH Director Dr. Elias A. Zerhouni. “We especially appreciate the opportunity to inform the public about the scientific research that is transforming our understanding and treatment of addictive disorders.”

Addiction is now understood to be a brain disease because

scientific research has shown that alcohol and other drugs can change brain structure and function. Advances in brain imaging science make it possible to see inside the brain of an addicted

person and pinpoint the parts of the brain affected by drugs of abuse — providing knowledge that will enable the development of new approaches to prevention and treatment.

“Media depictions of addiction are often very sensationalized,” says Mark Willenbring, M.D., Director of the Division of Treatment and Recovery Research at the National Institute on Alcohol Abuse and Alcoholism (NIAAA). “This is an opportunity to support a more accurate depiction of addiction.”

“Addiction is a disease — a treatable disease — and it needs to be understood,” says NIDA’s Dr. Volkow. “Our goal is for HBO’s *Addiction* documentary and project to educate the public about this disease and help eliminate the stigma associated with it.”

Dr. Volkow and Dr. Willenbring were featured in the HBO documentary, as were scientific research results and

## “This is an opportunity to support a more accurate depiction of addiction.”

— Mark Willenbring, M.D.



Mark Willenbring, M.D.,  
Director of the Division of Treatment and  
Recovery Research at the National Institute on  
Alcohol Abuse and Alcoholism (NIAAA)

Courtesy HBO

new understandings developed through the work of their respective institutes.

Currently, addiction affects 23.2 million Americans — of whom only about 10 percent are receiving the treatment they need. “HBO’s project offers us the opportunity to directly acquaint viewers with available evidence-based medical and behavioral treatments,” says NIAAA Director Ting-Kai Li, M.D. “This is especially important for disorders that for many years were treated outside the medical mainstream.”

Consisting of nine segments, the film presents an encouraging look at addiction as a treatable brain disease and the major scientific advances that have helped us better understand and treat it. From emergency rooms to living rooms to research laboratories, the documentary follows the trail of an illness that affects one in four families in the United States.

One segment, “The Adolescent Addict,” explains that the adolescent brain differs from the adult brain because it is not yet fully developed. According to NIDA’s Dr. Volkow, adolescent brains may be more susceptible to drug abuse and addiction than adult brains. However, because it is still developing, the adolescent brain may also offer an opportunity for greater resilience. Although treatment can yield positive results, many families are unwilling to look outside the home for help due to concerns about stigma.

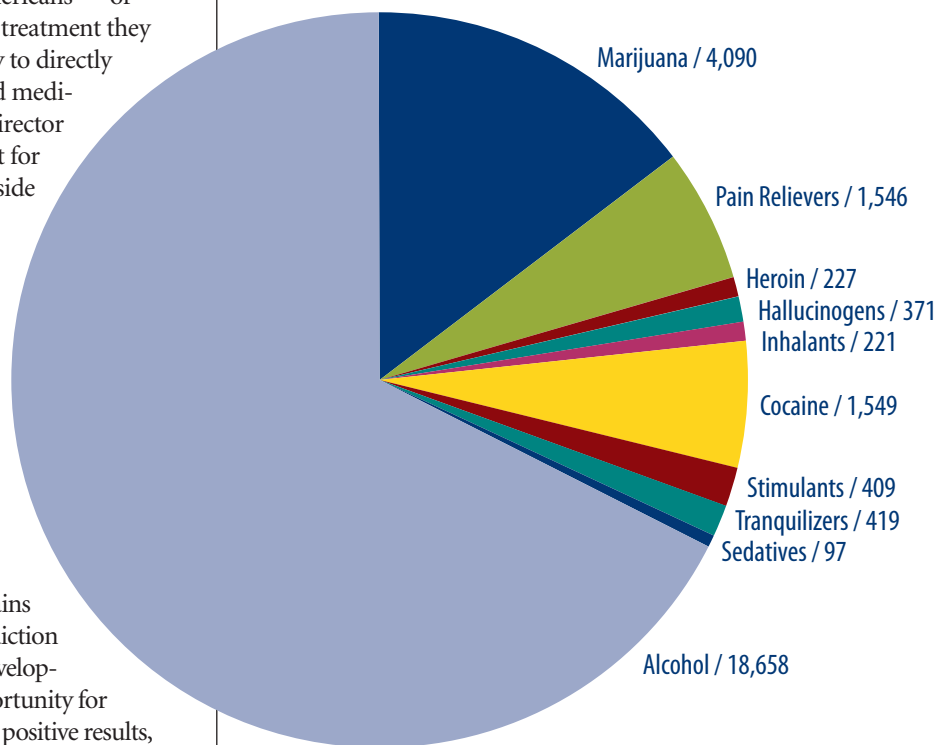
Medications for use in treating alcoholism also are a focus of the program, including a segment on topiramate, under study by NIH-supported researchers at a clinic in Charlottesville, Virginia. At present, there are three FDA-approved medications available to treat alcohol dependence: the older aversive agent disulfiram, and two newer anti-relapse medications. Naltrexone, available by tablet or monthly injections, interferes with drinking reward and reinforcement, and acamprosate works on multiple brain systems to reduce craving, especially in early sobriety. According to NIAAA’s Dr. Willenbring, these medications are not addictive and can be helpful adjuncts to treatment.

“There is a lot of exciting new scientific research information and treatments that we need to get out to the public,” says Dr. Willenbring. “I think that we are on the cusp of a paradigm shift in the treatment of alcohol abuse.”

The Addiction project also includes 13 short feature films from different directors on innovative family training and treatment approaches, interviews with leading experts, successful drug court programs that reduce relapses and re-arrests, and dealing with the dynamics of a disease that sometimes requires as much investment from family and community as it does from the individual struggling to recover. A comprehensive four-DVD set of the documentary and the 13 short films is available nationally. ■

**NOTE:** Although the dangers of nicotine addiction were not a part of this study, tobacco’s impact on the health of Americans will be included in future issues.

## Number (in Thousands) of Americans Age 12 and Older Dependent on or Abusing Alcohol and Illicit Drugs



Source: Substance Abuse and Mental Health Services Administration, 2005 National Survey on Drug Use and Health

## On the Web

- [www.hbo.com/addiction/](http://www.hbo.com/addiction/)  
This HBO Addiction interactive companion Web site allows visitors to customize information for their specific needs, with a special emphasis on treatment options. The site features original content by the nation’s leading experts in the science of addiction and addiction treatment, all 14 films in chaptered form, and comprehensive informational tips and resources.
- [www.drugabuse.gov](http://www.drugabuse.gov)  
The Web site for the National Institute on Drug Abuse (NIDA) contains information on all facets of drug abuse, as a part of NIDA’s mission to lead the nation in bringing the power of science to bear on drug abuse and addiction.
- [www.niaaa.nih.gov](http://www.niaaa.nih.gov)  
The Web site for the National Institute on Alcohol Abuse and Alcoholism contains research, resources, and related materials on the institute’s work in the fight against alcohol abuse and alcoholism.



Dr. Janelle Goetcheus in front of Christ House, the nation's first temporary residential respite care facility for the homeless, which she founded in 1985. "This country still needs to make a much more fundamental commitment to care for all its people," she insists.

## Janelle Goetcheus, M.D., Caring for and about Washington, DC's Homeless

“T he cold; I just didn’t notice it,” shrugged Donnie McGee as the nurse cut through the bandages covering his frost-bitten right foot. Two days later, most of it would be amputated.

But at last, McGee, homeless for years on the streets of Washington, DC, had found refuge in Christ House, a 33-bed temporary

# “The street

residential respite care facility for homeless men and women founded by Janelle Goetcheus, M.D., in 1985.

For pioneering this, the nation’s first such facility, and, the same year, founding Health Care for the Homeless Project, now known as Unity Health Care, a federally qualified health center operating 25 neighborhood health facilities in DC’s neediest areas, and for earlier starting Columbia Road Health Services, a medical clinic serving the capital city’s tens-of-thousands of Central American refugees and other extremely poor persons, Goetcheus was named a Local Legend of Medicine in 2004.

She was nominated by Eleanor Holmes Norton, Member of Congress from the District of Columbia, who describes her as a “skilled and talented physician whose hands search through poverty to find those with the greatest needs.”

Goetcheus found her life’s calling after first visiting Washington in 1976 with her minister husband — and being shocked at what they encountered. “I had wanted to be a doctor in a third-world country. Until I arrived here, I was ignorant of the whole sense of racial injustice, of poverty. I wasn’t aware we had the needs here. People shared their stories with me and I left, but with a deep sense of returning,” she recalls.

By 1978 she had come back, to stay, transforming a dilapidated apartment building (the Ritz!) into her first clinic. Columbia Road Health Services followed quickly in 1979, and, by 1985, she’d opened Christ House, moved in with her family and ever since has been a powerful force for ensuring that DC’s homeless and indigent receive quality health care.

“People come with great medical needs, with many complications, many of them terminal. Just being with the people here is

beyond words. It is a privilege to be with the community and with the people," she says.

A familiar, trusted figure along Columbia Road and in neighborhoods across the city, Goetcheus is now but one of a host of medical professionals, community workers, selfless volunteers, and many others from all backgrounds who contribute countless hours to serving those less fortunate through the innovative medical outreach system she started.

Says Dr. Stuart F. Seides, chairman of the District of Columbia Medical Society, who bestowed the 2002 American Medical Association "Pride in Profession" award on Goetcheus, "She is an inner-city missionary, utterly selfless. She has a vision in looking after the homeless and the dispossessed in the city."

One of these people is Nicola Richards, 37, homeless for most of his adult life and now undergoing treatment at Christ House for the rheumatoid arthritis which cripples him. "From the beginning, I didn't know what would happen," he says. "But when I learned to start trusting people, I started getting better.

"It's been a blessing. Physically, my legs have progressed. Mentally, I've been restored to make better choices. Spiritually, my foundation is set." ■

Nicola Richards, long lost to drugs, homelessness, and despair for most of his adult life, is checked by Dr. Janelle Goetcheus as part of his continuing treatment for crippling rheumatoid arthritis through Unity Health Care, a citywide, federally qualified health care organization.



# is her waiting room..."



Dr. Janelle Goetcheus on the street in front of Christ House, with, from left, Gregory Sims, James Selke and James Ross. Says Sims, "I don't know what would have happened to me if I hadn't come here. The people here really care!"

### Meet Your Local Legend!

Local Legends of Medicine

<http://www.nlm.nih.gov/locallegends/> is an online Web exhibit highlighting the contributions of outstanding women physicians in rural and urban communities across the country. Nominated by a congressional representative, each extraordinary physician has made a positive, enduring contribution to the health care of her community and to the country.

Local Legends is a companion to "Changing the Face of Medicine: Celebrating America's Women Physicians,"

<http://www.nlm.nih.gov/changingthefaceofmedicine/> an exhibition organized by the National Library of Medicine (NLM), Bethesda, MD, and the American Library Association, Chicago, IL, with support from the National Library of Medicine, the National Institutes of Health Office of Research on Women's Health, and the American Medical Women's Association that was displayed at the NLM from 2003 – 2005. A smaller version of Changing the Face of Medicine is now on travel across the country. For a schedule of this traveling exhibit, go to: <http://www.nlm.nih.gov/changingthefaceofmedicine/visit/>

# Fibroid Tumors in Women: A Hidden Epidemic?

It's estimated that about three-quarters of American women of childbearing age have fibroid tumors in their uteruses. These benign tumors can cause not only pain, anemia, excessive menstrual bleeding, and infertility — they are also responsible for a third of the 200,000 hysterectomies in the United States each year.



Dr. Cynthia Morton is seeking women who have fibroid tumors for a “sister study” to help researchers better understand and treat these common tumors. A part of her study has been funded by the NIH.

**T**he mental and physical toll of fibroid tumors in women can make life miserable.

“I was diagnosed with uterine fibroids after the birth of my second child, around age 30,” says one woman we will call Susan. “I tolerated the menstrual cramping and heavy flow associated with fibroids by taking Motrin as often as permitted. But over time, my symptoms got worse — headaches, fatigue, anemia, incontinence, and pain during intercourse. I used panty liners on a daily basis to protect against urine leakage.”

For more than seven years, Susan endured these symptoms until, finally, she underwent a hysterectomy and bladder repair. Her relief was tremendous.

What causes these tumors in women? Why do about 25 percent of those with fibroid tumors have these symptoms? And what causes black women to have three times the number of tumors than

whites? Those are among the questions that Cynthia Morton, Ph.D., and her colleagues at Harvard Medical School are trying to answer through a research effort that focuses on women and their sisters who exhibit these health problems.

“We are looking for variants in genes that may increase the chance to develop uterine fibroids,” says Dr. Morton, Director of Cytogenetics in the Department of Pathology at Brigham and Women’s Hospital. “We do this by recruiting sisters who have — or have had — fibroids. We need about 500 sister pairs and their relatives so that we can look at their DNA to see if there is a risk for a woman to develop tumors.”

Currently 379 sister pairs have so far filled out the two surveys

# NIH Study Seeks to Relieve Fibroid Pain with Fewer Side Effects

**R**esearchers at the National Institutes of Health's National Institute of Child Health and Human Development (NICHD) are evaluating a new treatment for women suffering from uterine fibroids: an experimental drug that blocks progesterone, a female sex hormone secreted by the ovaries. Because fibroids grow in response to progesterone, therapies that lower progesterone levels could cause fibroids to shrink. That could help relieve pain and other symptoms and possibly improve fertility in women with fibroids.

Currently there is only one effective hormone-reducing therapy available for relieving fibroid symptoms, but it has serious side effects. It works by blocking the master reproductive hormone, gonadotropin releasing hormone (GnRH). Blocking GnRH not only shuts down the body's production of progesterone. It also shuts down production of estrogen, another sex hormone. Since abruptly depriving the body of estrogen causes hot flashes and prolonged estrogen deprivation can weaken bones, this treatment can only be used short-term.

The NIH researchers hope to

develop a therapy that would block progesterone while leaving estrogen alone. In theory, such a treatment could shrink fibroids but spare women from hot flashes and bone weakening. Lynnette Nieman and her NIH coworkers are seeking volunteers for their study of the drug, called CDB-2914, which prevents progesterone from acting in the tissues but which does not interfere with estrogen action. The study will evaluate whether this drug causes fibroids to shrink in pre-menopausal women. Prospective volunteers must

- Be between 33 and 50 years old
- Have regular menstrual cycles
- Have a history of uterine fibroids that cause heavy bleeding, pressure, or pain.

After some preliminary medical tests, volunteers will receive either CDB-2914 or a placebo (an inactive compound) for three menstrual cycles. (Which option a woman receives is randomly assigned.) At the end of the treatment period, volunteers can choose one of several options: to receive a hysterectomy (surgery to remove the uterus) or a myomectomy (surgery where fibroids are removed but the uterus stays intact), or to receive three months of CDB-2914, regardless of whether or not they received it during the study. They can also choose to exit the study completely at that time.

**To find out more about the study, call the NIH Patient Recruitment and Public Liaison Office at 1-800-411-1222. The e-mail address is [prpl@mail.cc.nih.gov](mailto:prpl@mail.cc.nih.gov). Information about the study is also available from <http://fibroids.nichd.nih.gov/criteria.html>.**



Brigham and Women's Hospital

## Got Fibroids? Volunteers Wanted: Sisters Who Have (Or Have Had) Fibroids

The Center for Uterine Fibroids at Brigham and Women's Hospital is seeking participants for a study to identify the causes of uterine fibroid tumors. We are looking for families in which two sisters have (or have had) uterine fibroids. **The study involves filling out two surveys and giving a blood sample, all of which can be done by mail at no cost to you.** For more information, call the Center at 1-800-722-5520 (ask operator for 525-4434), e-mail us at [fibroids@rics.bwh.harvard.edu](mailto:fibroids@rics.bwh.harvard.edu), or visit our Web site: [www.fibroids.net](http://www.fibroids.net). You may also write to us at Center for Uterine Fibroids, 77 Avenue Louis Pasteur, NRB 160, Boston, MA 02115.

and given a blood sample to be a part of this "sister study." Dr. Morton and her colleagues are hoping that others will volunteer, as well, so that their study can help end the needless pain and suffering that many times goes along with the tumors. They also hope to find ways to reduce the symptoms of fibroid tumors that are less invasive than hysterectomy.

"My advice to other women with uterine fibroids," says Susan, who took part in the sister study, "is to listen to your body and keep a record of your family history. Treat the symptoms, but more importantly, treat the cause. Explore all of your options."

"We have to spread the word about fibroid tumors," says Dr. Morton. "By participating in this study, which is free and can be done by mail, women can help speed up research that will help future generations of women avoid the problems associated with these tumors." ■

The image shows the exterior of a large, modern brick building, identified as the National Institutes of Health Clinical Center. The building features multiple stories with numerous windows, many of which are illuminated from within, suggesting an evening or dusk setting. A prominent architectural feature is a large, curved, cantilevered structure that extends over a walkway or entrance area, supported by several thick, cylindrical columns. This structure is brightly lit from below, creating a warm, golden glow. The sky above is a deep blue, indicating twilight. The overall scene conveys a sense of a well-lit, active, and modern medical facility.

Welcome to the nation's  
clinical research hospital.

The National Institutes of Health

# Clinical Center



**The NIH Clinical Center:** For more than 50 years, the Center's physicians and scientists have been translating laboratory discoveries into better treatments, therapies and interventions to improve the nation's health. Presented here are three patients whose lives have been changed for the better at the Clinical Center.



**Annie Brown** of Washington, DC, has experienced recurrent pain crises associated with sickle cell disease since childhood. It's a chronic and often fatal form of anemia. In the United States, this inherited disease mainly strikes African Americans. Red blood cells typically are round and smooth. They move easily through blood vessels carrying oxygen to all parts of the body. In sickle cell anemia, the cells are shaped like a sickle—or crescent. Hard and sticky, these cells tend to get stuck in the vessels. When blood flow is blocked, the result is pain. What brought Annie to the Clinical Center was one of the disease's secondary effects: pulmonary hypertension, or high blood pressure in the arteries that supply the lungs. "I used to not be able to walk down steps without stopping," says Annie. "I couldn't do anything." Her study team is giving her blood exchange transfusions, inhalants such as oxygen and nitric oxide, and using vasodilators that open the blood vessels of the arteries. She's doing far better than her childhood doctors predicted. They told her parents that Annie "wouldn't live past age 18 and that she would never have children." Now 56, Annie has exceeded the median life expectancy for people with the disease (42 for men and 48 for women) and has two grown children.

**Clenton G. Winford**, a Texan, was 25 years old when he first came to the Clinical Center in 1988. Doctors there had just begun to study families diagnosed with von Hippel-Lindau (VHL). Clenton, whose father was diagnosed the year Clenton was born, volunteered for an observational study to help doctors learn what they could by monitoring the progress of the disease in those who have it. The disorder caused retinal tumors, which had resulted in Clenton's blindness. "I was dreadfully ill and had no idea what I should do," Clenton recalls. "I came here purely for research and was diagnosed, but then was offered treatment." As a volunteer patient in a series of research studies, he has had surgical removal of tumors and cysts from his brain, spinal cord, pancreas, adrenal gland, and end lymphatic sac. He also has had countless sessions of imaging scans and other tests to chart the progression of his disease. "Those of us who have been dismissed elsewhere and have been told there is nothing else to be done, find that by coming here, we have one more chance to look at our problems, maybe another roll of the dice — another turn at bat, if you will." Over the years, doctors involved in his care, with the help of volunteer patients with the disorder, have identified three different cancer genes and discovered two new diseases (Hereditary Papillary Renal Carcinoma and Familial Renal Oncocytoma), benefiting thousands of patients worldwide.



**Jane Diepstraten** of Stevensville, Montana, first came to the NIH Clinical Center in 2005 to be treated for a rare disease not typically found in children — Cushing’s Syndrome. Her adrenal glands produced too much of the hormone cortisol, which led to weight gain and slow growth in height. The first tell-tale sign for the family was Jane’s unusual weight gain, chronicled in her yearly school photos. A physician’s assistant and a doctor in Montana made the diagnosis. The family chose to come to NIH after an Internet chat room conversation with the mother of another child with Cushing’s who was treated at the Clinical Center. Doctors performed delicate surgery to remove Jane’s adrenal glands and put her on medication she will have to take for the rest of her life. She comes back once a year for follow-up and screening for the development of any other problems. “I’ve got my energy back. And, I’m not heavy anymore,” Jane says. Now she and her family want to help educate others. Jane did a school science fair project on Cushing’s Syndrome. She also wrote a book so that other young patients at the Clinical Center could read about her experience. And she wants to do more. “I want to be a doctor,” she says. “I want to be there for the kids going through the same stuff I went through.”



**Annie, Clenton and Jane** are among the more than 350,000 volunteers from around the nation and the world who have participated in clinical research at the National Institutes of Health Clinical Center in Bethesda, Maryland, since the hospital opened more than 50 years ago. Clinical research is how physician-scientists translate promising discoveries in the laboratory into better ways to treat, prevent, diagnose, and understand human disease.

“Clinical research volunteers come from all walks of life and are truly partners in medical discovery,” says Dr. John I. Gallin, Clinical Center Director. At the Clinical Center — the nation’s largest hospital devoted to clinical research and the most technologically advanced — this partnership has resulted in a long list of medical milestones, including first cure of a solid tumor with chemotherapy, gene therapy, successful replacement of a mitral valve, and use of AZT to treat AIDS.

There are about 1,500 clinical research studies in progress at the NIH Clinical Center every day. About half the studies are the first tests of new drugs or medical treatments in people. The rest are natural history studies of diseases — including many rare diseases. These long-term studies lead to better understanding of how diseases develop and to improvements in prevention and treatment.

All Clinical Center patients are seen as part of a clinical research study. There’s no cost for the care received. For more information — including opportunities for healthy volunteers to participate in clinical research — go online: <http://clinicalcenter.nih.gov>. Or call 1-866-999-1112 (TTY 1-866-411-1010).

## Because lives depend on it

Interested in finding out more about clinical research? A new NIH Web site offers important information to consider, options for participating, and personal stories from research volunteers. Go to: <http://clinicalresearch.nih.gov/>. There’s a link to [ClinicalTrials.gov](http://ClinicalTrials.gov), which provides information about trials across the country, including those at the NIH hospital.

# WISE EARS!®



Could you or a loved one have noise-induced hearing loss? Millions of Americans are experiencing hearing loss due to excessive noise exposure and other causes.

## 10 Ways to Identify Hearing Loss

Take the following quiz to help determine if you need to see a health professional about your hearing:



Do you have a problem hearing over the telephone?

Yes  No

Do you have trouble following the conversation when two or more people are talking at the same time?

Yes  No

Do people complain that you turn the TV volume up too high?

Yes  No

Do you have to strain to understand conversation?

Yes  No

Do you have trouble hearing in a noisy background?

Yes  No

Do you find yourself asking people to repeat themselves?

Yes  No

Do many people you talk to seem to mumble (or not speak clearly)?

Yes  No

Do you misunderstand what others are saying and respond inappropriately?

Yes  No

Do you have trouble understanding the speech of women and children?

Yes  No

Do people get annoyed because you misunderstand what they say?

Yes  No

**If you answered "Yes" to three or more of these questions, you may want to see an otolaryngologist (an ear, nose, and throat specialist) or an audiologist for a hearing evaluation.**

For more information about your hearing health, contact the NIDCD Information Clearinghouse:  
Voice: (800) 241-1044  
TTY: (800) 241-1055  
E-mail: [nidcdinfo@nidcd.nih.gov](mailto:nidcdinfo@nidcd.nih.gov)  
Internet: [www.nidcd.nih.gov](http://www.nidcd.nih.gov)



WISE EARS!® is a national campaign to prevent noise-induced hearing loss. The NIDCD Information Clearinghouse is a service of the National Institute on Deafness and Other Communication Disorders (NIDCD), National Institutes of Health (NIH), U.S. Department of Health and Human Services (HHS).



Hispanic TV superstar Don Francisco and the National Library of Medicine have teamed up to promote the new Spanish-language MedlinePlus.gov/salud Web site.

# Welcome to MedlinePlus en español

**D**on Francisco, the popular Hispanic television host, recently announced a new joint effort with the National Institutes of Health's National Library of Medicine to increase public awareness and promote a free, comprehensive, authoritative health information Web site for Spanish speakers in the United States and worldwide — MedlinePlus.gov, Spanish-language version ([www.medlineplus.gov/salud](http://www.medlineplus.gov/salud)).

The star of the popular TV variety show *Sabado Gigante* (Spanish for *Giant Saturday*) is teaming up with the world's largest medical library to mount a major public service campaign to encourage Hispanics to use MedlinePlus.gov en español for their health information needs. MedlinePlus includes information on over 700 health topics, drug and herbal



supplements, interactive tutorials, and health-related news stories.

“Do you want to learn more about your health quickly and easily?” Don Francisco asks Hispanic TV and radio audiences in public service announcements released in May. He adds, “It’s simple. Visit MedlinePlus, the bilingual Web site with the most complete and reliable health information in the world.”

The new public service campaign, including television and radio announcements featuring Don Francisco, will target U.S. Hispanic and Latin American audiences and will encourage viewers to “get updated on their health with MedlinePlus.gov/salud.”

Over the years, Don Francisco, whose real name is Mario Kreuzberger, has often been described as the Spanish-speaking equivalent of Johnny Carson, Ed Sullivan, or David Letterman. *Sabado Gigante* is as popular among Hispanic audiences in the United States (where it airs on the Univision network) as it is in countries all over Latin America. In fact, *Sabado Gigante* is so well known among Spanish-speaking viewers that President George W. Bush has appeared on the program twice — first in 2000 (when he was running against Al Gore), then in 2004 when Francisco interviewed both Bush and his Democratic rival, Massachusetts Senator John F. Kerry — who also recognized that a *Sabado Gigante* appearance was a perfect way to court Hispanic voters.

The National Library of Medicine is confident that Spanish speakers will be attracted to the **MedlinePlus.gov/salud** Web site by the host of what is now the longest running television variety show in the world. And, Hispanics are an important population to reach. Surveys show more than 50 percent of adult Hispanics in the United States use the Internet. More than half of those, in fact, look to the Web for medical and health information. In response to this, the National Library of Medicine developed its popular consumer health information Web site, MedlinePlus, in Spanish. Now users can find many of the authoritative, full-text resources that are available on MedlinePlus “en español,” too.

Examples of Don Francisco’s :30 and :15 second TV public service announcements can be viewed at <http://www.nlm.nih.gov/medlineplus/spanish/> ■

**The new public service campaign, including television and radio announcements featuring Don Francisco, will target U.S. Hispanic and Latin American audiences.**

## BIENVENIDO

“Bienvenido a la versión en español de MedlinePlus, el portal de Internet de información de salud para el público de la Biblioteca Nacional de Medicina, la biblioteca médica más grande del mundo. Los profesionales de la salud y el público en general pueden depender de su contenido confiable y actualizado.”

— Donald A.B. Lindberg, M.D.  
Director, Biblioteca Nacional de Medicina  
[MedlinePlus.gov/salud](http://MedlinePlus.gov/salud)

# HEALTH LINES

... quick tips for seasonal health, safety and fun

## “Ah, when the sun beats down . . .”

The National Cancer Institute estimates there will be more than 1 million new cases of skin cancer in the United States this year. With summer on the way, it's important to protect yourself and your family.

The best way to prevent skin cancer is to guard against the sun. For children, it's especially important from an early age. Doctors suggest that everyone limit time in the sun and avoid other sources of ultraviolet (UV) radiation:

- Stay out of the midday sun (mid-morning to late afternoon) whenever you can and protect against reflected UV radiation (from sand, water, or snow). UV radiation can go through light clothing, windshields, windows, and clouds.
- Wear long sleeves and long pants of tightly woven fabrics, and a hat with a wide brim to absorb UV.
- Use sunscreen lotions, especially broad-spectrum sunscreen (to filter UVB and UVA rays) with a sun protection factor (SPF) of at least 15. But you still need to avoid the sun and wear protective clothing.
- Stay away from sunlamps and tanning beds — which can increase the chances for deadly melanoma.

To protect your vision, the National Eye Institute advises wearing sunglasses and a hat with a brim to block the sun's UV rays and help delay cataracts, which cause cloudy or blurry vision, poor night vision, and other symptoms. If you must be out in the heat, the National Center for Environmental Health advises:

- Limit outdoor activity to morning and evening hours.
- Cut down on exercise. When you exercise, drink two to four glasses of cool, nonalcoholic fluids each hour. A sports beverage can replace the salt and minerals lost in sweat. Warning: If you are on a low-salt diet, talk with your doctor before drinking a sports beverage.
- Try to rest often in shady areas.
- Visit adults at risk at least twice a day and closely watch them for signs of heat exhaustion or heat stroke. Infants and young children, of course, need much more frequent watching.

## Online Continuing Education Series on Complementary and Alternative Medicine

NIH's National Center for Complementary and Alternative Medicine (NCCAM) announces a free online lecture series on complementary and alternative medicine (CAM). The 8-chapter series is available to both health care providers and members of the public and includes video lectures and interactive tests on topics such as herbs, acupuncture, and spirituality. It is just one of many NCCAM educational tools to enable patients and physicians to talk to each other about CAM use. Health care providers can earn CME/CEU credits. To learn more, visit <http://nccam.nih.gov/videolectures>.



## With the game on the line, safety pays off!

From pick-up basketball in the backyard to summer league seasons of organized baseball, more Americans than ever are participating in recreational sports. The following tips from the U.S. Centers for Disease Control and Prevention are designed to help keep athletes of all ages at the peak of their abilities.

### What children can do:

- Be in proper condition to play the sport; have a preseason physical exam.
- Follow the rules of the game.
- Wear appropriate protective gear.
- Know how to use athletic equipment.
- Avoid playing when very tired or in pain.
- Make warmups and cooldowns part of your routine. Exercises, such as stretching or light jogging, can help minimize the chances of muscle strain or other soft tissue injury. They also make the body's tissues warmer and more flexible. Cooldown exercises loosen the muscles that have tightened during exercise.

### For adult athletes:

- Don't be a "weekend warrior," packing a week's worth of activity into a day or two; try to maintain a moderate level of activity throughout the week.
- Learn to do your sport right. Proper form reduces the risk of "overuse" injuries such as tendonitis and stress fractures.
- Remember safety gear. Depending on the sport, this may mean knee or wrist pads, chest protector, helmet, or more.
- Accept your body's limits. You may not be able to perform at the same level you did 10 or 20 years ago; modify activities as necessary.
- Increase exercise levels gradually.
- Strive for a total body workout of cardiovascular, strength training, and flexibility exercises; cross-training reduces injury and promotes fitness.

## “An ounce of prevention . . .”

For more tips on avoiding the sun's effects, playing sports safely and confidently, or maintaining your health, season by season, go to [www.medlineplus.gov](http://www.medlineplus.gov).

# 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 Cancer Institute (NCI)** [www.cancer.gov](http://www.cancer.gov)  
1-800-4-CANCER (1-800-422-6237)
- **National Eye Institute (NEI)** [www.nei.nih.gov](http://www.nei.nih.gov)  
(301) 496-5248
- **National Heart, Lung, and Blood Institute (NHLBI)**  
[www.nhlbi.nih.gov](http://www.nhlbi.nih.gov) (301) 592-8573
- **National Human Genome Research Institute (NHGRI)** [www.genome.gov](http://www.genome.gov)
- **National Institute on Aging (NIA)**  
[www.nia.nih.gov](http://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](http://www.niaaa.nih.gov)  
(301) 443-3860
- **National Institute of Allergy and Infectious Diseases (NIAID)** [www.niaid.nih.gov](http://www.niaid.nih.gov)  
(301) 496-5717
- **National Institute of Arthritis and Musculoskeletal and Skin Diseases** [www.niams.nih.gov](http://www.niams.nih.gov)  
1-877-22NIAMS (1-877-226-4267)
- **National Institute of Biological Imaging and Bioengineering (NIBIB)**  
[www.nibib.nih.gov](http://www.nibib.nih.gov) (301) 451-6772
- **National Institute of Child Health and Human Development (NICHD)** [www.nichd.nih.gov](http://www.nichd.nih.gov)  
1-800-370-2943
- **National Institute on Deafness and Other Communication Disorders (NIDCD)**  
[www.nidcd.nih.gov](http://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](http://www.nidcr.nih.gov)
- **National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)** [www.niddk.nih.gov](http://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](http://www.nida.nih.gov) (301) 443-1124
- **National Institute of Environmental Health Sciences (NIEHS)** [www.niehs.nih.gov](http://www.niehs.nih.gov)  
(919) 541-3345
- **National Institute of General Medical Sciences (NIGMS)** [www.nigms.nih.gov](http://www.nigms.nih.gov)  
(301) 496-7301
- **National Institute of Mental Health (NIMH)**  
[www.nimh.nih.gov](http://www.nimh.nih.gov) [niminfo@nih.gov](mailto:niminfo@nih.gov)  
1-866-615-6464
- **National Institute of Neurological Disorders and Stroke (NINDS)** [www.ninds.nih.gov](http://www.ninds.nih.gov)  
[braininfo@ninds.nih.gov](mailto:braininfo@ninds.nih.gov)  
1-800-352-9424
- **National Institute of Nursing Research (NINR)**  
[www.ninr.nih.gov](http://www.ninr.nih.gov) (301) 496-0207

## Centers & Offices

- **National Library of Medicine (NLM)**  
[www.nlm.nih.gov](http://www.nlm.nih.gov) 1-888 FIND NLM
- **Center for Information Technology (CIT)**  
[www.cit.nih.gov](http://www.cit.nih.gov) (301) 594-6248
- **Center for Scientific Review (CSR)**  
[www.csr.nih.gov](http://www.csr.nih.gov) (301) 435-1115
- **Fogarty International Center (FIC)**  
[www.fic.nih.gov](http://www.fic.nih.gov)
- **National Center for Complementary and Alternative Medicine (NCCAM)**  
[www.nccam.nih.gov](http://www.nccam.nih.gov) 1-888-644-6226
- **National Center on Minority Health and Health Disparities (NCMHD)** [www.ncmhd.nih.gov](http://www.ncmhd.nih.gov)  
(301) 402-1366
- **National Center for Research Resources (NCRR)**  
[www.ncrr.nih.gov](http://www.ncrr.nih.gov) (301) 435-0888
- **NIH Clinical Center (CC)**  
[www.cc.nih.gov](http://www.cc.nih.gov)
- **Office of Research on Women's Health (ORWH)**  
<http://orwh.od.nih.gov> (301) 402-1770

## NIH MedlinePlus Advisory Group

**Marin P. Allen, Ph.D.**, Office of Communications and Public Liaison, NIH

**Christine Bruske**, National Institute of Environmental Health Sciences

**Vicky Cahan**, National Institute on Aging

**Kym Collins-Lee**, National Eye Institute

**Kate Egan**, National Institute of Mental Health

**Marian Emr**, National Institute of Neurological Disorders and Stroke

**Ray Fleming**, National Institute of Arthritis and Musculoskeletal and Skin Diseases

**Colleen Guay-Broder**, National Institute of Biomedical Imaging and Bioengineering

**Susan Johnson**, National Institute of Dental and Craniofacial Research

**Kathy Kranzfelder**, National Institute of Diabetes and Digestive and Kidney Diseases

**Carol Krause**, National Institute on Drug Abuse

**Lonnie Lisle**, National Institute on Deafness and Other Communications Disorders

**Ann London**, National Institute of Allergy and Infectious Diseases

**Richard E. Manrow, Ph.D.**, National Cancer Institute

**John McGrath, Ph.D.**, National Institute of Child Health and Human Development

**Gregory Roa**, National Institute of Alcohol Abuse and Alcoholism

**Dennis Rodrigues**, Office of Communications and Public Liaison, NIH

**Diane Striar**, National Heart, Lung, and Blood Institute

**Chris Thomsen**, National Center for Complementary and Alternative Medicine

**Larry Thompson**, National Human Genome Research Institute

**Anne Thurn, Ph.D.**, Office of Dietary Supplements

# Genetics

## Home Reference



The Genetics Home Reference (GHR) Web site — [ghr.nlm.nih.gov](http://ghr.nlm.nih.gov) — is a free, trustworthy, patient-friendly guide to the science of genetics. The site has over 500 topics on genetic conditions and related genes, and an illustrated tutorial that explains the basics of genetics and a glossary of genetics terms.

Physicians can order free “InfoRx” prescription pads for the Genetics Home Reference site at [informationrx.org](http://informationrx.org).

The Web site is produced by the National Library of Medicine (NLM). The prescription pad is a joint program by the NLM and the National Institute of Child Health and Human Development, both of the National Institutes of Health, as well as the American Academy of Pediatrics, the American Academy of Family Physicians, the American College of Obstetricians and Gynecologists, and the American College of Medical Genetics.



U.S. DEPARTMENT OF HEALTH  
AND HUMAN SERVICES

Go to [ghr.nlm.nih.gov](http://ghr.nlm.nih.gov)