

# NIH MedlinePlus

Trusted Health Information  
from the National  
Institutes of Health

Summer 2006

the magazine

## Winning the Race

Lance Armstrong  
Shares His Struggle  
To Survive Cancer...  
and Thrive!

medlineplus.gov

## Beware America's Silent Killer

Detecting and  
Managing High  
Blood Pressure

## *Achoooooo!*

This Is the "Season  
of the Itch"—What You  
Can Do About It

## Dream Robber

The Challenges of Living  
with Parkinson's Disease



**The Hon. Paul G. Rogers**

Chairman, Friends of the National Library of Medicine and former member of the U.S. Congress from Florida (1955-1979)



**A**s chairman of the Friends of the National Library of Medicine (FNLM), I am delighted to welcome you to *NIH MedlinePlus* magazine and the MedlinePlus Web site. We want you, your family and friends to know that you can have confidence that the information you read here and on the Web site comes directly from our nation's best scientists and the world's leading medical and health research organization, the National Institutes of Health.

Our mission is to support the Library's vital role to collect, organize and disseminate biomedical information. Because we believe strongly that the Library is a national treasure, we also want you to be aware that we are building a coalition of members to help inform the public, as well as the health and corporate communities, about the Library's continuing contributions to society.

If you are interested in becoming a Friend of the National Library of Medicine, you will find a membership envelope inside this exciting inaugural issue of the *NIH MedlinePlus* magazine. You may also use the envelope to sign up for a free subscription to the magazine.

On behalf of the Friends of the National Library of Medicine, we hope that you find the information presented in these pages over the coming months and years to be helpful.

Thank you for your interest.

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

## Helping the Library Extend Medical Knowledge

In 1986, the Friends of the National Library of Medicine (FNLM) was formed as a nonprofit organization to promote, publicize and support the Library. FNLM is a coalition of individuals, medical associations and societies, hospitals, health science libraries, corporations and other nonprofit organizations dedicated to increasing public awareness and public use of the National Library of Medicine.

The mission of the Friends of the National Library of Medicine is to improve health by increasing the use of the latest, most effective medical and scientific information by health care professionals, scientists and the general public. The major objective of the Friends is to educate the health, corporate and public communities about the National Library of Medicine and to do this by building a coalition of financial and other supporters.

## NATIONAL LIBRARY OF MEDICINE at the NATIONAL INSTITUTES OF HEALTH



8600 Rockville Pike, Bethesda, MD 20894

[www.nlm.nih.gov](http://www.nlm.nih.gov)  
[www.medlineplus.gov](http://www.medlineplus.gov)

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## Welcome to **NIH MedlinePlus**, the magazine



### The Nation's Medical Research Agency

With roots in the 19th century, the National Institutes of Health (NIH) is the world's leader in medical research. Comprised of 27 separate Institutes and Centers, NIH is the primary federal agency for conducting and supporting medical research, providing leadership and financial support to top scientists in every state in the nation and throughout the world.

Supported by the American taxpayer, NIH research has led to tremendous breakthroughs in what we know about diseases and how to prevent, detect, diagnose and treat them. More than 80 percent of NIH's funding is awarded through almost 50,000 competitive grants to more than 212,000 researchers at over 2,800 universities, medical schools and other research institutions in every state in the U.S. and around the world.

It is a pleasure to support the National Library of Medicine and the Friends of the National Library of Medicine in launching the first issue of *NIH MedlinePlus*. This quarterly guide for patients and their families brings to you the latest and most authoritative medical and healthcare information from the National Institutes of Health (NIH) as featured online at the MedlinePlus Web site. Your physician has made this magazine available to you as a free health resource; please take a copy with you today.

The MedlinePlus Web site is a free and comprehensive public health information resource from the world's largest medical library, NIH's National Library of Medicine. MedlinePlus has extensive information from the NIH and other trusted sources on more than 700 diseases and conditions. There are also lists of hospitals and physicians, a medical encyclopedia and a medical dictionary, health information in Spanish, extensive information on prescription and nonprescription drugs, health information from the media and links to thousands of medical clinical trials.

This magazine will provide you with a gold standard of reliable, up-to-date health information in a very user-friendly format that can act as a springboard to the Web site. Each issue will highlight four major health conditions, offering the latest advice on prevention, diagnosis, treatment and research findings. Regular features will include the latest information on

how to stay healthy for a lifetime and will also profile some of the most fascinating people—from laboratory scientists and public figures to patients just like you—who are making a difference in the search for medical advances.

The American people have made a long-term investment in the crucial medical research being carried on by the NIH. *NIH MedlinePlus* magazine is an important way to make this research and healthcare information even more accessible and useful to health professionals and patients alike.



*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.*

The National Institutes of Health is an agency of the U.S. Department of Health and Human Services.

Dear Reader,

It is a pleasure to welcome you to *NIH MedlinePlus* magazine, your guide to the vast resources that you will find at [MedlinePlus.gov](http://MedlinePlus.gov), the free Web site of authoritative health information from the National Institutes of Health (NIH) and other trusted sources.

[MedlinePlus.gov](http://MedlinePlus.gov) was created by the National Library of Medicine, a part of the NIH and the U.S. Department of Health and Human Services. Founded in 1836, primarily for doctors, the Library has expanded its mission and now serves the general public as well as health professionals.

Each month, the public, physicians and health professionals view some 75 million pages of timely health information on the [MedlinePlus](http://MedlinePlus.gov) Web site. There is no advertising, no registration and the site is completely free. In addition to a remarkable array of consumer-friendly information, there are convenient links to the scientific medical literature (PubMed), a registry of 27,000 clinical trials, extensive information about genetic diseases and much more. The Web site is updated daily, so it always carries the latest information.

I hope that you, your family and friends will find this magazine useful. If you would like to receive *NIH MedlinePlus* regularly, please fill out the subscription envelope attached inside this issue. And take a look at the Web site. I think you will find a wealth of information that will help keep you and your loved ones healthy.



Dr. Donald Lindberg and grandson explore [www.medlineplus.gov](http://www.medlineplus.gov).

Sincerely,  
Donald A.B. Lindberg, M.D.  
Director, National Library of Medicine

## A National Treasure-House of Knowledge

The National Library of Medicine (NLM), on the campus of the National Institutes of Health in Bethesda, Maryland, is the world's largest medical library. The Library, which has long served health professionals, educators and scientists, now also provides free information for the general public at [www.medlineplus.gov](http://www.medlineplus.gov).



NLM collects materials in all areas of biomedicine and health-care, as well as works on biomedical aspects of technology, the humanities and the physical, life and social sciences. The collections stand at more than 8 million items—books, journals, technical reports, manuscripts, microfilms, photographs and images. Housed within the Library is one of the world's finest medical history collections of old and rare medical works. NLM is a national resource for all U.S. health science libraries through the National Network of Libraries of Medicine.



# Clinical Trials

A Crucial **Key** to Human Health Research

At the forefront of human health research today are clinical trials—studies that use human volunteers to help medical professionals observe and test new treatments for a wide array of health products and practices



**A** clinical trial is a research study designed to answer specific health questions by using human volunteers to help test those answers. Carefully conducted clinical trials are the fastest and safest way to find treatments that work in people, and there are clinical trials going on all the time in virtually every area of medical research. People who volunteer to take part in clinical trials do so for several reasons, including the chance to play a more active role in their own health care, gain access to new research treatments before they are widely available and help others

by contributing to medical research.

There are several different kinds of clinical trials, including:

- **Treatment trials** to test experimental treatments, new combinations of drugs or new approaches to surgery or radiation therapy.
- **Prevention trials** that look for better ways to prevent disease in people who have never had the disease, or to prevent a disease from returning. These approaches may include medicines, vitamins, vaccines, minerals or lifestyle changes.

- **Diagnostic trials** to find better tests or procedures for diagnosing a particular disease or condition.
- **Screening trials** that test the best way to detect certain diseases or health conditions.
- **Quality of Life trials** (or Supportive Care trials) that explore ways to improve comfort and the quality of life for individuals with chronic illnesses.

The latest and most complete information about clinical trials today is available at the [ClinicalTrials.gov](http://ClinicalTrials.gov)



Web site (<http://clinicaltrials.gov>). This is a free, confidential online resource from the National Institutes of Health (NIH), which anyone with a computer and Web browser can tap into for a comprehensive listing of clinical studies—in the U.S. and abroad—sponsored by the NIH and other federal agencies, pharmaceutical companies, universities and nonprofit organizations.

Here's how it works. After you enter the ClinicalTrials.gov Web site, you can search for a trial by the name of the disease, the location of the study, the type of treatment or the sponsoring

institution. The results will show you what studies are under way, whether a trial is actively recruiting, the purpose of the study, where and when it will take place and whom to contact for more information.

“From the very beginning, ClinicalTrials.gov has been designed for use by patients,” observes Donald Lindberg, M.D., director of the National Library of Medicine (NLM), the coordinating agency for NIH. “With patients taking an increasingly active role in their own healthcare, they now have a chance to learn more about clinical studies on everything from Alzheimer’s disease to zinc supplementation. Without question, it has helped investigators with their research recruiting efforts, too.”

Launched in February 2000, ClinicalTrials.gov currently contains information on more than 27,000 trials. The site has proven very popular with the public, logging approximately 8 million page views monthly and hosting over 20,000 visitors daily. The site is updated regularly, with new information added every day.

ClinicalTrials.gov has many helpful features for the consumer. If you are checking out trials on breast cancer, for example, the site also links you to the NLM’s MedlinePlus ([www.medlineplus.gov](http://www.medlineplus.gov)), with in-depth information on the topic, including recent news articles and an interactive tutorial. ClinicalTrials.gov also points you to NLM’s Genetics Home Reference site ([www.ghr.nlm.nih.gov](http://www.ghr.nlm.nih.gov)), helping you understand possible genetic factors that can increase the incidence of the disease. It allows you to search medical journal references via NLM’s PubMed

([www.pubmed.gov](http://www.pubmed.gov)) and links to the National Cancer Institute ([www.nci.nih.gov](http://www.nci.nih.gov)), the lead NIH institute on this particular topic.

“It’s really one-stop shopping, allowing the user to dig deeper for information on the disease or condition after viewing the list of clinical trials,” says Dr. Lindberg. “ClinicalTrials.gov is a powerful tool for the individual health care consumer, and it has untold benefits for the public health, too, as new drugs and therapies evolve from these important studies.” ■

## How to Participate

Clinical trials are sponsored or funded by a variety of organizations or individuals, such as physicians, medical institutions, foundations, voluntary groups and pharmaceutical companies, in addition to federal agencies such as the NIH, the Department of Defense (DOD) and the Department of Veterans Affairs (VA). Trials can take place in different locations, such as hospitals, universities, doctors’ offices and community clinics.

If you would like to participate in a clinical trial, you can find opportunities and more information at government Web sites such as:

- <http://www.clinicaltrials.gov>
- <http://www.cancer.gov/search/clinicaltrials> (Cancer studies)
- [http://www.aidsinfo.nih.gov/clinical\\_trials](http://www.aidsinfo.nih.gov/clinical_trials) (HIV and AIDS studies)

# Winning the Race

**Lance Armstrong** Shares His Struggle  
To Survive Cancer ... and Thrive!



The world knows and celebrates Lance Armstrong for his remarkable defeat of life-threatening cancer and for his unparalleled seven consecutive victories in the Tour de France bicycle race. But, as Armstrong reveals in this exclusive interview, he is prouder of his cancer victory than all of his racing wins.

Armstrong, whose non-profit Lance Armstrong Foundation (LAF) is now a leader in the fight against cancer, knows all too well the impact that cancer of any kind can have on an individual. In 1996, his own aggressive form of testicular cancer metastasized into his lymph nodes, lungs and brain. Armstrong underwent two surgeries, one to remove his cancerous testicle and another to remove two cancerous lesions on his brain. Over a three-month period, he received four rounds of chemotherapy. For these reasons, he understands that defeating cancer cannot be done alone.

As he told doctors, researchers and clinical trial participants on one of his visits to the NIH's National Cancer Institute (NCI), without their cancer research and that of others, "...quite frankly, I wouldn't be here today. And I certainly wouldn't

have clipped into a pedal and started a bike race ever again."

Success stories such as Armstrong's are part of an evolving strategy in the fight against cancer, notes Andrew von Eschenbach, M.D., NCI director and acting commissioner, U.S. Food and Drug Administration.

"Over the course of the 20th century, the primary strategy for treating cancer was 'seek and destroy,'" he says. "Now, in an effort to preserve healthy cells and improve outcomes, we are increasing efforts to 'target and control' cancer by modulating and altering the behavior of the disease. Someday we will eliminate cancer, but for today, our immediate goal is to eliminate the suffering and death due to cancer." (Read more comments from Dr. von Eschenbach on page 8.)

That is one of the many reasons that

Dr. von Eschenbach finds Lance Armstrong's story so compelling: "Lance is a cancer survivor who represents so many, many others across this country and the world who have faced the challenge of cancer," he says. "He is an example to us of what is possible, what is within our grasp—a world in which no one suffers and no one dies as a result of cancer."

## **How did you learn of your cancer, and how did you feel about it?**

I was diagnosed with advanced testicular cancer on October 2, 1996. I had ignored the symptoms for months; pain comes with professional cycling, so it was easy to dismiss the soreness in my groin, headaches and difficulty breathing. I reluctantly went to the doctor after my testicle had swollen to three times its normal size.



I owe a lot to my neighbor—a friend and doctor who insisted I get it checked out. By the time I was diagnosed, the cancer had already spread to my lungs and brain, so it is fair to say I was in bad shape.

How did I feel about it? Probably the same as anyone who has ever been diagnosed feels about cancer—I was in complete shock. Here I was, young and healthy and riding better than ever and, suddenly, I have cancer. I was worried about losing my career and, frankly, my life. I didn't know how to tell my mom, and I was scared and angry.

I can now say that my life is better because of my cancer experience. Though I wouldn't wish it for anyone, I believe I appreciate my life in a completely new and better way because I faced cancer and was lucky enough to survive. Having said that, I also believe that cancer still affects far too many people, and we must continue to work to change that fact.

**You say that “knowledge is power” in fighting cancer. From your experience, what are the two or three most important things you believe cancer patients should keep in mind?**

My mom and a core group of friends helped me spend countless hours reading information and asking questions. It's really important, and I can't stress that enough. You must be your own best advocate to be sure the treatment you are getting is best for you.

I got a second opinion, which can be tough to do. We are inclined to trust our doctors implicitly and not question them, but the second opinion I got was the right one for me. So, I would encourage people to seek

more opinions and to not be afraid to question their doctors.

I also think that a person with cancer needs to seek out support from friends and family. I had a group of people there for me—to listen to me, cheer me on or remind me that I wasn't really alone. I was lucky to know that other people were invested in my survival; you can never overestimate the benefit of that kind of support and friendship.

**In addition to talking with your doctors, did you seek information from the National Cancer Institute, and how important was it to you?**

At the time, I didn't know anything about the NCI and all the resources available to people with cancer. I discovered the NCI while researching information about my diagnosis, and I believe it is a very important resource.

I would encourage anyone facing cancer to seek more questions and not be afraid. Especially now, with the increased use of the Web, it is amazing how much information is available to a new patient.



Armstrong and the Lance Armstrong Foundation hold LIVESTRONG Challenge cancer-research fund-raisers in various cities across the country, such as this 2005 Ride Portland event in Oregon. For details, visit [www.livestrongchallenge.org](http://www.livestrongchallenge.org).

Beyond supplying information, the work of the NCI represents our government's commitment to cancer. That is why the current \$40 million in budget cuts proposed for the NCI are wrong. There is a long budget battle ahead, and I know the Senate has proposed an amendment to restore funding. We cannot back away from our

## MedlinePlus and NCI Cancer Resources

Main MedlinePlus Web page:  
[www.medlineplus.gov](http://www.medlineplus.gov)

MedlinePlus cancer types:  
<http://www.nlm.nih.gov/medlineplus/cancers.html>

Patient education tutorials:  
<http://www.nlm.nih.gov/medlineplus/tutorial.html>

Drugs, supplements and herbal information:  
<http://www.nlm.nih.gov/medlineplus/druginformation.html>

Updated information about federally and privately supported clinical research in human volunteers:  
<http://clinicaltrials.gov>

Directories of health-care professionals, services and facilities:  
[www.nlm.nih.gov/medlineplus/directories.html](http://www.nlm.nih.gov/medlineplus/directories.html)

National Cancer Institute (NCI):  
[www.cancer.gov/](http://www.cancer.gov/)

Links to all types of cancer:  
[www.cancer.gov/cancertopics](http://www.cancer.gov/cancertopics)



On Wednesday, May 17, you can help Lance and the LAF be a voice for change. Thousands of people will take part in LIVESTRONG Day events across the country to raise awareness of and bring attention to an issue that impacts all Americans—cancer. For more information, visit [www.livestrong.org](http://www.livestrong.org).

commitment to beating cancer, and the NCI is critical in that fight.

**What is the message you would most like to send to people recently diagnosed with cancer?**

Hope. There can and should be life after cancer for more people, and I want people to know that.

At a Lance Armstrong Foundation (LAF) event in Austin last fall, a lung cancer survivor told the audience that she changed doctors because the first one seemed to write her off.

She said she fired the doctor because, as she put it, “I can’t have more hope than you do. I need someone to believe in me.” Maybe that’s why she is still here and was able to come to Austin to share her story.

Cancer is tough, and it still claims too many lives, but I think that hope is the greatest weapon a person has. Ask the

tough questions, get a second opinion, take care of yourself, surround yourself with family and friends, and do whatever you have to do to keep hope alive.

**The goal of this new magazine, *NIH MedlinePlus*, is to give people access to trusted, easily understood information about dealing with disease and staying healthy. Do you often hear from people seeking such reliable information?**

Constantly. A cancer diagnosis changes a person forever. It is an overwhelming and confusing thing, particularly since there are so many types of cancer and so many outcomes. More than anything else, people just want information. They want to know about treatment, treatment centers, side effects, fertility and depression and, of course, how they are going to

## Working Together, We Can Defeat Cancer

An interview with Andrew C. von Eschenbach

**Cancer—in all its forms—continues to take a huge toll on people across the world. In your opinion, where do we stand in the fight today?**

This year, more than 1.4 million Americans will hear the words, “You have cancer.” One out of every two men and one out of every three women during their lifetime will hear the words, “You have cancer.” One American every minute is dying as a result of this disease. Now, we need fresh thinking about new goals—goals that remain focused not as a cure but as a long-term solution for controlling cancer.

In 1971—the same year that Lance Armstrong was born—the National Cancer Act was passed, and the country committed its resources to conquer cancer. That journey has led us to a truly transformational moment. The

National Cancer Institute has committed itself to a goal, one based on our emerging understanding of cancer as a disease process. Our plan is to eliminate the suffering and death that result from this process that we understand as cancer, and we are committed to a goal of doing so as early as 2015.

**In what ways do you see the fight against cancer changing so dramatically?**

We have the ability within our grasp, based on the trajectory of progress, to expand our understanding of the fundamental mechanisms that give rise to our susceptibility to cancers, the early events of malignant transformation, the progression and the metastatic spread and the ultimate death that we see all around us in our friends and relatives.

pay for their care. One of the goals of the LAF is to provide information to people about the physical, practical and emotional consequences of cancer. It's a big job, and this information is in demand, so we welcome more resources for people with cancer.

**Could you share a brief anecdote or moment that occurred during your treatment that speaks to you about how the courageous struggle by cancer patients can be a meaningful boost to other cancer patients?**

While I was being treated, my nurse, Latrice Haney, started introducing me to other patients. It was good for me. That was when I truly began to grasp the magnitude of cancer—more than 8 million people living with it at the time. I got really angry and became interested in fighting cancer, not just

my own, but cancer in general. I knew that I needed to use this experience to help others, which was how the idea for the Foundation began.

I'm lucky to meet so many people through the LAF that remind me how courageous the average cancer patient is. And it's a reminder that cancer doesn't discriminate. I have met people from all over the world with all types of cancer and more brave kids than I can count. A person could get discouraged by that, but we use it to inspire us to work harder.

**What is your goal for the Lance Armstrong Foundation?**

We want to inspire and empower people with cancer. We want to provide people with the practical tools and information they need to live strong.

We are doing that through

research, advocacy and public health programs. It's a big job; we are fully dedicated to it.

**What does the future hold for Lance Armstrong?**

I hope to live up to the words of one of my doctors—Dr. Craig Nichols—and continue to fulfill the obligation of the cured by leading a grassroots movement to reduce incidence, increase survival and offer each person with cancer the opportunity to live their life on their own terms.

I am grateful for the tremendous and unforgettable experiences my cycling career has brought me, but I am most proud to be a cancer survivor and a parent. It is these two roles that will guide my future. ■

We are now understanding the molecular mechanisms that control the process, and we are learning how to exploit those mechanisms to prevent, detect, eliminate or control the process.

**Would you give us examples of how the NCI and its many researchers across the globe are proceeding in their work?**

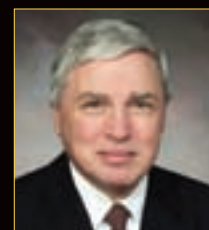
Genomics, proteomics and emerging technologies are enabling us to profile not only diseases but the persons who bear those diseases. We can, thus, understand the genetic and molecular differences, so that we can begin to personalize intervention strategies.

In our recent experience with lung cancer, we have seen the introduction of the drugs Iressa and Tarceva, which are targeted to affect an enzymatic pathway involved in the proliferation and growth of cancer cells. By understanding the genetic mutations that lead to that abnormal pathway,

we can identify those patients who might benefit from that particular intervention.

Also, we are moving from an era in which imagery is no longer simply enabling us to see a lump on a chest X-ray or a mass on a CT scan, but enabling us to visualize—using molecular imaging—the biology of the disease in real time. For example, in gastrointestinal cancer, using the new drug Gleevec, you can use radioactive imaging agents to see in 24 or 48 hours whether you have changed the biochemistry of that tumor.

What we thought was impossible back in 1971 is a reality today. What we think is impossible today—a world in which no one would suffer or die from cancer—can become a reality if we make it happen together.



**Andrew C. von Eschenbach, M.D.**  
Director, National Cancer Institute; Acting Commissioner, Food and Drug Administration



## HEART DISEASE

*doesn't*

## CARE WHAT YOU WEAR

### IT'S THE #1 KILLER OF WOMEN

These women know *The Heart Truth*—no matter how great you look on the outside, heart disease can strike on the inside. And being a woman won't protect you.

**Try these risk factors on for size:** Do you have high blood pressure? High blood cholesterol? Diabetes? Are you inactive? Are you a smoker? Overweight? If so, this could damage your heart and lead to disability, heart attack, or both.

The Red Dress is a red alert to take heart disease seriously. Talk to your doctor and get answers that may save your life. *The Heart Truth* is, it's best to know your risks and take action now.

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



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Heart, Lung, and Blood Institute; National Institutes of Health • Office on Women's Health

American Heart Association • WomenHeart: the National Coalition for Women with Heart Disease

# Pressure Points:

## Preventing and Controlling Hypertension

May is National High Blood Pressure Education Month, a good time for many Americans to make sure that they and their loved ones are protected against this silent killer.



Nearly one in three adults—almost 65 million Americans—suffers from hypertension, or high blood pressure. What's more, high blood pressure leads to more than half of all heart attacks, strokes and heart failure cases in the United States. It also increases the risk of kidney failure, blindness and other serious health consequences.

Faced with such alarming statistics and based on a landmark 2002 study called the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), the National Institute of Health's National Heart, Lung, and Blood Institute (NHLBI) has begun a comprehensive, nationwide educational outreach program to better identify and treat high blood pressure.

"It often takes years for the results of major studies to become part of standard healthcare," says NHLBI Director Elizabeth G. Nabel, M.D. "The results of ALLHAT and the clinical guidelines could have an enormous impact on the health of millions of Americans. By aggressively sharing this information, we will be able to put the results into action more quickly and more effectively."

Throughout May, which is National High Blood Pressure Education Month,

physicians and communities across the country will be taking part in the activities planned to inform the public how to recognize and treat hypertension.

### Living by the Numbers

For patients and their families alike, it is critical to understand the basics in order to be able to better control the disease.

Simply put, blood pressure is the force exerted by blood on the walls of the arteries and veins as it courses through the body. Like the ocean tide, it is normal for blood pressure to rise and fall throughout the day. But when the pressure stays elevated over time, it causes the heart to pump harder and work overtime, possibly leading to various, serious health problems, ranging from hardening of the arteries, stroke and brain hemorrhage to kidney malfunction and blindness.

Blood pressure is recorded as two

numbers, the systolic (pressure during a heartbeat) over the diastolic (pressure between heartbeats). For example, a measurement of 120/80 millimeters of mercury (mmHg) is expressed as "120 over 80." Normal blood pressure is less than 120/80. People with pressures between 120/80 and 139/89 are considered to have pre-hypertension and be likely to develop high blood pressure without preventative measures.

Today, clinical guidelines recommend that physicians work with patients to keep their blood pressures below 140/90 mmHg, and even lower for people with diabetes or kidney ailments. In all cases, patients are encouraged to lose excess weight, exercise regularly, not smoke, limit intake of alcoholic beverages, and follow heart-healthy eating plans, including cutting back on salt and other forms of sodium.

## ADDITIONAL INFORMATION ON HYPERTENSION

MedlinePlus: High blood pressure: <http://www.nlm.nih.gov/medlineplus/highbloodpressure.html>

Tutorial on high blood pressure: <http://www.nlm.nih.gov/medlineplus/tutorials/hypertension/htm/index.htm>

DASH eating plan: [http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new\\_dash.pdf](http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf)

Links to clinical trials: <http://clinicaltrials.gov/ct/gui/action/FindCondition?ui=D006973&recruiting=true>

Types of blood pressure medications: [http://www.nhlbi.nih.gov/hbp/treat/bpd\\_type.htm](http://www.nhlbi.nih.gov/hbp/treat/bpd_type.htm)

### Assessing Your Risk

While many Americans develop high blood pressure as they get older, it is not a hallmark of healthy aging. This is especially critical for African-Americans, in whom the disease tends to begin at an earlier age and be more severe. In addition to being at increased risk, they also experience higher rates of death from stroke and kidney disease than does the general population.

As the following examples illustrate, the indicators for high blood pressure vary widely from individual to individual and bear very close, personal vigilance.

- Ron Tucker, a 42-year-old African-American suffering from hypertension, is always on the go. His biggest challenge to lowering his blood pressure is to watch what he eats, especially fast food. “African-Americans are very sensitive to salt,”

he says, “so I’ve got to be more careful, especially at lunch when I usually grab a burger and fries. Besides the fat, that meal has lots of salt.”

- Carol Jackson, 42 and white, has thus far managed to avoid a diagnosis of high blood pressure although her readings do fall within the pre-hypertension range, putting her on notice. Further reasons to remain on guard include a family history of high blood pressure, lack of regular exercise and the fact that she smokes. “My mother and father both had high blood pressure, and my father passed away from a stroke when he was only 59,” she says.

By adopting healthier lifestyles, Tucker, Jackson and the millions more facing hypertension can begin controlling their conditions. “Don’t wait until your pressure spikes to make changes,” urges Lawrence Appel, M.D., M.P.H., lead author of a February 2006 report in *Hypertension: Journal of the American Heart Association*, which links healthier eating habits to lowered blood pressure.

“While an individual’s blood pressure may be normal now, 90 percent of Americans over 50 years of age have a lifetime risk of high blood pressure,” says Appel, a professor at Johns Hopkins University School of Medicine. “Americans should take action before being diagnosed with high blood pressure.”

### An Ounce of Prevention

For example, because blood pressure rises as body weight increases (and obesity is a known risk factor for developing high cholesterol and diabetes, which in turn can lead to heart disease), a loss of little as 10 pounds can help to lower blood pressure.

Two recent studies confirm the blood

pressure benefits of maintaining a healthy diet. First is the Dietary Approaches to Stop Hypertension (DASH) clinical study, which tested the effects of food nutrients on blood pressure. It emphasizes consumption of fruits, vegetables and low-fat dairy foods, whole grains, poultry, fish and nuts, and stresses reduction of fats, red meats, sweets and sugared beverages.

Second is the DASH-sodium study, which demonstrates the importance of lowering sodium intake. Most Americans consume far more than the current, daily recommendation of 2,400 milligrams (mg) of sodium—about a teaspoon of table salt—or less. This includes all salt and sodium consumed, not just at the table, but also in cooking. For those with high blood pressure, consuming even less may be advisable, since the DASH-sodium study revealed that diets containing no more than 1,500 mg of sodium per day had still greater pressure-lowering effects.

Regular physical activity is another good step toward controlling or even preventing high blood pressure. Start with 30 minutes of moderate-level activity, such as brisk walking, bicycling or gardening on most—preferably all—days of the week. The activity even may be divided into three, 10-minute periods each. For added benefit, these moderate half-hours may be increased or supplanted by regular, vigorous exercise. Of course, prior to upping the activity level, people should check with their physicians, especially if they have had heart trouble or a previous heart attack, a family history of heart disease at an early age or other serious health problems.

Another healthy move is to limit alcohol intake. Excess alcohol can raise blood pressure as well as damage the liver, heart and brain. Drinks should be kept to a

maximum of one per day for women, and two for men. (One drink equals 12 ounces of beer or five ounces of wine.)

Finally, quit smoking. Among other things, smoking damages blood vessel walls and speeds hardening of the arteries. Ceasing smoking reduces the risk of heart attack in just one year.

### **Taking Control**

High blood pressure is a silent killer, often with no obvious or visible symptoms. The only way to find out if you have hypertension is through testing by your physician, who will make the diagnosis on the basis of two or more readings taken on different visits.

For much more information on high blood pressure, log onto the NIH Medline Plus Web site ([www.medlineplus.gov](http://www.medlineplus.gov)), the free, consumer-friendly health and medical resource featuring thousands of definitions, encyclopedia articles, interactive tutorials and clinical trials. ■

## **Hypertension—Listen to Your Heart**

An interview with Elizabeth G. Nabel

### **Why should Americans be concerned about high blood pressure?**

Hypertension—or high blood pressure—is a serious public health problem affecting one in three Americans. Known as the “silent killer” because it usually has no symptoms, with high blood pressure, the heart works harder, your arteries take a beating and your chances of a stroke, heart attack and kidney problems are greater. Because it affects circulation, high blood pressure also creates a higher risk for mental deterioration and Alzheimer’s. Once high blood pressure develops, it usually lasts a lifetime but the good news is that it can be treated and controlled by keeping a healthy weight, exercising regularly, following a healthy eating plan, reducing intake of salt and sodium, and consuming alcohol in moderation if you drink.

### **I have heard about the DASH Eating Plan to help control hypertension. What is it?**

DASH stands for Dietary Approaches to Stop Hypertension. The DASH Eating Plan is a diet rich in fresh fruits, vegetables, low-fat dairy, fish and poultry, which studies sponsored by the NHLBI have shown can achieve large reductions in blood pressure. For those who also reduce salt and sodium consumption, the decrease in blood pressure has been shown to be even more significant. The DASH Eating Plan promotes a diet that is low in saturated fat, cholesterol and total fat, as well as lowered intake of red meat, sweets and sugar-containing beverages. You can find and print out the DASH Eating

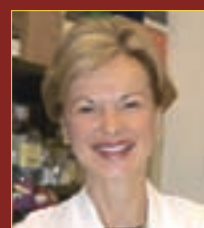
Plan on the NHLBI Web site at [www.nhlbi.nih.gov/health/public/heart/hbp/dash/](http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/).

### **Where do we stand in the fight against hypertension?**

High blood pressure causes more visits to doctors than any other condition and, along with its complications, costs the U.S. economy more than \$100 billion annually. Just a 10 percent decline in the number of doctor visits would save \$478 million each year. Data from clinical trials indicate that controlling hypertension with medicines can produce a 55 percent reduction in heart failure, a 37 percent reduction in strokes and a 27 percent reduction in heart attacks.

### **What is the long-range prognosis for controlling high blood pressure?**

Controlling high blood pressure is doable, which is especially important news for the nearly 60 million Americans who are over the age of 55 and face a 90 percent likelihood of developing high blood pressure in their lifetimes. They should have their blood pressures measured and follow their doctors’ advice and faithfully do the things that can make a healthy difference: lose weight; eat “heart healthy” diets low in fat, cholesterol, sodium and salt; and spend 30 minutes each day walking or doing some other form of physical activity.



**Dr. Elizabeth G. Nabel**  
Director, National Heart, Lung, and Blood Institute (NHLBI)

# *Dream* **Robber:**

Living with Parkinson's disease





**A**s a boy, John Kuhn dreamed of becoming a pilot. Mechanically minded and good with his hands, he earned his first “wings” at 16. At 26, he became a commercial airline pilot, eventually rising to captain on the strength of his experience and finely honed motor skills.

Now 65, he has been permanently grounded by Parkinson’s disease, unable, due to the loss of motor control in his right hand and leg, to qualify for the special license he needs to fly the sleek jet airplane he dreamed of building and taking to the skies in retirement.

“Except for having to give up flying, Parkinson’s hasn’t changed my life much,” he says bravely, but a little wistfully.

Diagnosed with the disease in 1998, actor Michael J. Fox perhaps best captured the dramatic impact it can have when he said, “Parkinson’s forced me to make a fundamental life decision: adopt a siege mentality—or embark upon a life journey.”

Fox since has become one of the nation’s foremost advocates for finding a cure for the disease, which was first described in 1817 by English physician James Parkinson as “the shaking palsy.” In the early 1960s, researchers identified a fundamental brain defect that is the hallmark of PD: the loss of brain cells, or neurons, in an area known as the substantia nigra that produce dopamine, a chemical that helps direct smooth, purposeful muscle activity.

Like Kuhn, Fox, Muhammad Ali and former U.S. Attorney General Janet Reno, some 50,000 Americans from all



**“It hasn’t changed my life much except...”**

walks of life are diagnosed each year with Parkinson’s, and more than one-half million people are affected at any one time. Responder of neither fame nor fortune, PD strikes all over the world, affecting men at a slightly higher rate than women.

### **Subtle onset of classic symptoms**

Parkinson’s disease—the most common form of parkinsonism, a group of disorders with similar features—produces a wide range of problems that appear and progress at different rates and to varying degrees from individual to individual. Early symptoms are often subtle and may include mild shaking of the limbs (tremor), slowness of movement or stiffness.

Often, family or close friends may notice other changes in the person with PD, including decreased facial expression, increasingly soft voice or progressively more illegible handwriting. As the disease advances, four classic clinical signs typically appear:

- **Tremor**—rhythmic, back-and-forth trembling of the hands, arms, legs, jaw or face
- **Rigidity**—stiffness of the limbs and/or trunk
- **Bradykinesia**—the slowing down and loss of spontaneous and automatic movement, particularly frustrating because it may be unpredictable, and what once was routine, like washing or dressing, may take significantly longer

■ **Instability**—impaired balance and stooped posture

Other clinical features sometimes present include depression; emotional problems, such as anxiety; loss of motivation; difficulty swallowing; urinary problems or constipation; oily

skin and scalp; excessive sweating and a variety of sleep difficulties.

### **Difficult to diagnose**

Typically a disease of late middle age, Parkinson's usually affects people over the age of 50, with 60 being the average age of onset—just what happened

to John Kuhn two months after his mandatory 60th birthday retirement as a commercial pilot. However, research over the last several years has demonstrated that as many as 10 percent of Parkinson's patients may experience onset before 40, like Michael J. Fox when he was diagnosed.

Even for experienced neurologists, accurately diagnosing Parkinson's in its early stages can be difficult in some cases. No blood or laboratory tests are available, so physicians may have to observe patients for some time until it is apparent that clinical signs and symptoms are consistent with a diagnosis of PD.

### **Effective drug relief**

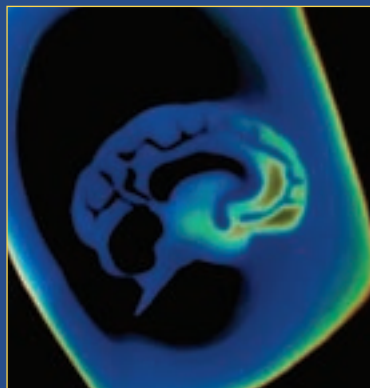
Although there currently is no cure, various medications can provide dramatic relief from many of Parkinson's debilitating motor (movement-related) symptoms. Physicians tailor treatment to a patient's particular condition since no two people react the same way to a given drug.

The primary therapy for PD is replacement of dopamine via levodopa (also called L-dopa, from the full name L-3,4-dihydroxyphenylalanine), a simple chemical found in plants and animals with which neurons can make dopamine to replenish the brain's dwindling supply; dopamine agonists, which mimic the role of dopamine in the brain; or a combination of both.

Introduced in the 1960s, levodopa relieves many troublesome symptoms of PD, extending the time in which the majority of patients—who would otherwise be very disabled—can lead relatively normal, productive lives. (Dopamine itself cannot be given

## Unraveling Parkinson's: Three Clues

As yet, there is no way to predict the majority of cases of PD or prevent disease progression. Studies have shown that Parkinson's patients have lost 60 to 80 percent of the dopamine-producing cells in their substantia nigra before symptoms begin. Researchers don't know why or how the cells die, but they are beginning to find fascinating new clues.



**Free radicals:** One theory holds that free radicals—unstable and potentially damaging molecules generated by the body's normal chemical reactions—may contribute to nerve cell death, thereby leading to Parkinson's in a process called oxidation. Evidence that oxidative mechanisms may cause or contribute to the disease includes the findings that Parkinson's patients exhibit increased brain levels of iron and decreased levels of ferritin, a protein that stores, or binds, iron in the body.

**Environmental toxins:** Some scientists have suggested that Parkinson's may occur from exposure to an environmental risk factor such as a pesticide or a toxin. This theory is based on the fact that a number of toxins are known to induce Parkinsonian symptoms in humans.

**Genetics:** A relatively new theory explores the role of genetic factors, since 15 to 25 percent of Parkinson's sufferers have a close relative who has experienced parkinsonian symptoms (such as a tremor).

# Parkinson's Disease: The Newest Advances

An interview with Story C. Landis

## What are the risk factors for developing Parkinson's?

The clearest risk factor is age. In addition, researchers have identified a number of genes that cause or contribute to Parkinson's disease (PD), as well as potential environmental risk factors. A primary piece of evidence that environmental factors play a role is that the relative risk of PD is higher in industrialized countries. Farmers and other agricultural workers also have an increased risk of developing PD, suggesting that exposure to toxic chemicals or other environmental factors present in industrial and agricultural areas might increase the risk of PD. In some studies, coffee drinking has been inversely associated with PD, but the evidence is uncertain, and combining coffee and hormone therapy may actually increase women's risk for developing PD. Smokers have a lower rate of PD—about 50 percent less—than nonsmokers, but the relationship between smoking and Parkinson's disease is not clear. Contrary to popular belief, minor head injury does not cause Parkinson's disease. A new study indicates that exercise may lower PD risk.

## What is the most promising area of current research?

There are a lot of promising areas in PD research, but one of the most exciting is genetics. Researchers have identified a number of genes and chromosomal regions believed to play a role in PD. Studying the gene mutations responsible for inherited cases can help researchers understand both inherited and sporadic types of the disease. Identifying gene defects may be able to help researchers develop animal models that accurately mimic the neuronal death in human PD, identify new drug targets and improve diagnosis. Based on genetic findings, investigators have

already developed improved animal models, so essential for our understanding of what causes the disease and for testing new treatments, and have made breakthroughs in cell biology that are helping to elucidate the various neurodegenerative processes and mechanisms in PD. In the future, it may become possible to test for individual gene differences in order to customize treatment of individual PD patients.

And these basic research successes are translating into the clinic: We now have a number of new and exciting therapeutic strategies at or near the point of clinical testing. These include neuroprotection using various medications, other substances, or nerve growth (neurotrophic) factors and gene therapy. Other potential therapies still being tested in animals include a vaccine to modify the immune system in a way that can protect dopamine-producing neurons, stem cell therapy and inhibition of inflammatory enzymes, including COX-2.

## How close are we to developing a cure?

It is not possible to predict a precise time line for major breakthroughs or a cure for PD—even in this time of great scientific progress. But we are initiating clinical trials that we believe will be critical to improving the treatment and quality of life of individuals with PD, developing a framework so that basic research can be effectively translated into treatments, and continuing to invest in essential basic research—the foundation for progress in medical science.



**Story C. Landis, Ph.D.**

Director, National Institute of Neurological Disorders and Stroke

because it doesn't cross the blood-brain barrier, the elaborate meshwork of fine blood vessels and cells that filters blood reaching the brain.)

Levodopa is combined with the drug carbidopa, which delays the conversion of levodopa into dopamine until it reaches the brain; prevents or diminishes some of its common side effects, such as nausea, vomiting and

low blood pressure; and reduces the amount of levodopa needed.

Levodopa does not, however, replace lost nerve cells or stop Parkinson's progression. Bradykinesia and rigidity respond best, while tremor may be less responsive. Problems with balance and other symptoms are often not responsive to dopaminergic therapy. Recent studies show that adding

certain medications, either tolcapone or entacapone, can prolong the relief gained from levodopa-carbidopa.

There are other medications for particular symptoms or stages of Parkinson's, including:

- **Apomorphine, bromocriptine, pergolide, pramipexole, ropinirole**—which mimic

# Additional Information on Parkinson's

## Web Links

MedlinePlus: <http://www.nlm.nih.gov/medlineplus/parkinsonsdisease.html>

Information from NINDS: Parkinson's Disease: Hope through Research: [http://www.ninds.nih.gov/disorders/parkinsons\\_disease/detail\\_parkinsons\\_disease.html](http://www.ninds.nih.gov/disorders/parkinsons_disease/detail_parkinsons_disease.html)

Links to clinical trials: <http://clinicaltrials.gov/ct/gui/action/FindCondition?ui=D010300&recruiting=true>

Genetic information: <http://ghr.nlm.nih.gov/condition=parkinsonsdisease>

Interactive tutorial from MedlinePlus (slideshow): <http://www.nlm.nih.gov/medlineplus/tutorials/parkinsonsdisease/htm>

## Handy Publications\*

- "Know Your Brain," an 8-page fact sheet that explains how the healthy brain works and what happens when the brain is diseased or dysfunctional
- "Parkinson's Disease: Challenges, Progress, and Promise"
- "Deep Brain Stimulation for Parkinson's Disease"

## \* Available from:

NIH NINDS  
P.O. Box 5801  
Bethesda, MD 20824  
<http://www.ninds.nih.gov>  
1-800-352-9424

dopamine and can be given alone or with levodopa, may be used in the disease's early stages or started later.

- **Selegiline**—also known as deprenyl, selegiline provides some benefit for the symptoms of PD and may prolong the effect of levodopa
- **Anticholinergics**—initially the principal treatment for Parkinson's prior to levodopa, the benefit of these drugs is limited but they may help to control tremor and rigidity
- **Amantadine**—an antiviral drug often used alone in the early stages of the disease, or with an anticholinergic or levodopa. Amantadine is sometimes also used to treat side effects of levodopa called dyskinesias.

## Surgery to relieve symptoms

Prior to the development of levodopa, treating Parkinson's with surgery was common but it is currently reserved primarily for those patients with advanced PD. Today's preferred surgical approach is deep brain stimulation (DBS), which uses a surgically implanted, battery-operated medical device called a neurostimulator—similar to a heart pacemaker and approximately the size of a stopwatch—to deliver targeted electrical stimulation to block the abnormal nerve signals that generate Parkinson's symptoms.

Unlike previous surgeries, DBS does not damage healthy brain tissue by destroying nerve cells. The advantage to DBS as compared with lesion surgery is that the stimulation settings can be

adjusted by a physician in the office, and to some extent by patients in particular cases.

Although most patients still need to take medication after undergoing DBS, many experience considerably reduced symptoms and some are able to lower their doses. This helps reduce side effects, such as involuntary movement, associated with the long-term use of levodopa.

## Fighting for future health

As a world leader in research on neurological disorders, the National Institute of Neurological Disorders and Stroke (NINDS) supports twelve Morris K. Udall Parkinson's Disease Research Centers of Excellence throughout the country. Much of the recent progress on Parkinson's has been funded through the Centers and many other NIH grants.

New studies have identified several genes that cause or contribute to PD and some potential environmental risk factors. These findings are improving our understanding of the processes that cause cell death in PD. In addition, a number of promising therapies are now being tested. And continuing research into the underlying biology of the disease is certain to lead to better ways of relieving Parkinson's debilitating symptoms and, ultimately, to halting or preventing the disease itself. ■



choose fruits & vegetables



play active games

Who can  
make **it**  
happen?



plan active outings



share low-fat meals

## ALL PARENTS CAN!

For a free handbook with food, activity and screen time tips,  
visit <http://wecan.nhlbi.nih.gov> or call 1-866-35-WECAN.



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
National Institutes of Health

# Achoooooo!

Nothing to Sneeze At



**A**s we enter the sneezing season, outdoor allergies are on the rise for many Americans. The cost to our healthcare system from all allergies—indoor and outdoor—is becoming truly breathtaking.

If you are one of the 18.2 million Americans who suffer from allergic rhinitis, or “hay fever,” chances are you may be sneezing, reaching for a box of tissues or rubbing your itchy, red, watery eyes as you read this. It’s May and the start of yet another allergy season, when pollen seems to cover the universe and very little relief is in sight.

While many of us endure mild to moderate symptoms, the larger truth is that the world of allergies is a complex and costly landscape. More than 50 million Americans suffer from all forms of allergies, which are the sixth-leading cause of chronic diseases in the United States. In 1996, hay fever alone accounted for nearly 14 million doctor visits and cost the healthcare system approximately \$1.9 billion. For unknown reasons, the incidence of hay fever has risen substantially in the past 15 years.

These are just a few of the reasons why the NIH’s National Institute of Allergy and Infectious Diseases (NIAID) is committed to funding ongoing research for new ways to manage and, perhaps, even prevent allergic diseases. In 2005, NIAID awarded more than \$116 million in grants and contracts for investigation into the mechanisms, diagnosis, treatment and prevention of allergic diseases, including asthma and allergic rhinitis.

For more than 50 years, NIAID research has led to new diagnostic tests, vaccines, therapies and technologies that have improved the health of millions

of people in the United States and around the world. One such NIAID-funded study has shown recently that an environmental intervention program to reduce indoor allergens, especially from cockroach and dust mites, in the homes

of inner-city children with moderate to severe asthma is quite effective in reducing allergen levels and asthma symptoms. Since continued exposure to allergens induces asthma’s symptoms, avoiding them is an attractive approach,

## Finding Relief from Allergy’s Grip

- **Antihistamines.** These medications counter the effects of histamine, the substance that makes eyes water and noses itch during allergic reactions. While helpful in alleviating symptoms, older antihistamines often can cause adverse side effects, such as drowsiness. Newer antihistamines are as effective as older antihistamines, but do not cause drowsiness and have very few side effects. However, antihistamines do not effectively treat severe allergy symptoms or nasal swelling (congestion).
- **Topical nasal steroids.** These anti-inflammatory nasal sprays help by decreasing the number of inflammatory cells in the nose and reducing mucus production and nasal swelling. Nasal steroids work well in combination with antihistamines and are relatively free of side effects.
- **Cromolyn sodium.** Also a nasal spray, cromolyn sodium can help stop hay fever, perhaps by blocking release of histamine and other symptom-producing chemicals. This product has few side effects.
- **Decongestants.** Decongestants constrict blood vessels and thereby may relieve nasal congestion. Available in oral and nasal preparations, decongestants thin nasal secretions and can reduce swelling and sinus discomfort. They are usually used in combination with antihistamines. They are intended for short-term use; long-term usage can actually make symptoms worse.
- **Immunotherapy.** Immunotherapy (allergy shots) might be a good course of action for patients who have had inadequate symptom relief with antihistamines and topical nasal steroids. Through injection under the skin, immunotherapy alters the body’s immune response to allergens and thereby helps prevent allergic reactions.

## How pollen makes us sneeze and wheeze

1. Pollen enters eyes, nose, lungs sensitizing the immune system.

2. Specific antibodies to the pollen are produced.

3. Antibodies attach to mast cells found in tissues.

4. Pollen enters the body again, attaches to antibodies causing histamine and other chemicals to be released from mast cells.

5. Allergic reaction is triggered resulting in runny eyes and nose, throat and nose itching, sneezing, nose and sinus congestion and asthma.

Source: American Academy of Allergy, Asthma and Immunology

according to Anthony S. Fauci, M.D., NIAID Director.

“The NIAID-sponsored Inner City Asthma Study in children demonstrates that environmental interventions reduce wheezing in proportion to the reduction in allergens,” he says. (Read more comments from Dr. Fauci on page 23.)

Information on this and other NIH-funded allergy studies, as well as a host of other resources on allergies of all kinds, is available at [www.medlineplus.gov](http://www.medlineplus.gov).

### Nuisance or Health Threat?

For most people, hay fever is a seasonal nuisance—something to endure for a few weeks once or twice a year. But for others, such allergies can be life-altering conditions that lead to more serious complications, including sinusitis and asthma.

■ Sinusitis, one of the most commonly reported chronic diseases, is the

inflammation or infection of the paranasal sinuses, which are four pairs of cavities located within the skull. Congestion here can lead to pressure and pain over the eyes, around the nose or in the cheeks just above the teeth. Chronic sinusitis is associated with persistent inflammation and is often difficult to treat. Extended bouts of hay fever, for instance, can increase the likelihood of development of chronic sinusitis. The annual cost of managing sinusitis has been estimated as high as \$5.8 billion.

■ Asthma is a disease of the lungs in which the primary symptom is a narrowing or blockage of the airways, resulting in wheezing, shortness of breath, coughing and other breathing difficulties. Asthma attacks can be triggered by viral infection, cold air, exercise, anxiety,

allergens and other factors. Allergic asthma is responsible for almost 80 percent of all asthma diagnoses. It presents the same symptoms as nonallergic asthma, but differs in that it is set off primarily by an immune response to specific allergens.

Both sinusitis and allergic asthma are manageable, but the research challenge always is to go beyond controlling the symptoms to address the root causes of disease.

### Defending Against Invaders

In a normal immune system, invading bacteria and viruses trigger antibodies, which are “programmed” to remember and defend against these germs in the future. During an allergic reaction, however, the immune system treats generally harmless allergens, such as pollen, mold, animal dander or dust mites, as pathogens and begins producing large amounts of immunoglobulin E (IgE) antibodies.

Allergic reactions are the biological equivalent of a fire drill: The body defends itself against a potential pathogen although none is present. The process is repeated as long as the immune system detects the allergen. Some allergy sufferers are genetically disposed to have a sensitive immune system. In addition, the severity of allergy symptoms can become worse due to illness or pregnancy.

That is what happened to Amy Kindt, a Mt. Clemens, Michigan, mother of two, who always suffered from hay fever when pollen counts rose during the spring and fall. However, since she became pregnant with her first child in 2000, the frequency of her symptoms has gone way up.



# Fighting Allergies with Research and Information

An interview with Anthony S. Fauci

**Are seasonal allergies on the rise? If so, why?** There has been an increase in seasonal allergies, but this trend may be leveling off. The reasons for the increase are unclear, but one explanation may be common lifestyle changes that include less physical exercise and more exposure to air pollutants and less contact with microorganisms and childhood infections as a result of the broad public health advances of the past century. With regard to the latter, the "hygiene hypothesis" suggests that microorganisms alter the way our immune systems react to allergens, so our chances of developing allergies increase in the absence of exposure to infectious agents.

**What research has been done recently in the area of seasonal allergies? Specifically, have there been any significant findings or breakthroughs in allergy shots, e.g. are there new medications that "last longer" between shots?** Recent findings include the discovery that allergen therapy delivered under the tongue, called sublingual immunotherapy, is effective in treating seasonal allergies, and substantially safer than the standard two- to three-year course of allergy shots, called subcutaneous immunotherapy. Another recent finding is that children who do not have asthma, but have seasonal allergies and receive subcutaneous immunotherapy, are far less likely to develop asthma over the ensuing years.

**I read that an immunotherapy for airborne-allergy vaccine is nearing FDA approval, perhaps in time for the 2006 allergy season. If so, what is the name of this product, what allergies will it protect against and when can people expect to have access to it?**

Recently, the NIAID-sponsored Immune Tolerance Network partnered with Dynavax on the clinical trial of a product called Tolamba. This trial showed that Tolamba was highly effective in reducing ragweed

symptoms, and symptom relief persisted for a year after the treatment was completed. If future clinical trials are equally successful, this could lead to Food and Drug Administration approval of the Dynavax product in two to three years, with major benefits to ragweed allergy patients by shortening the duration of treatment compared to standard allergen immunotherapy. The feasibility of developing comparable approaches against other seasonal allergies is still uncertain.



Anthony S. Fauci, M.D.  
NIAID Director

**Have there been changes in the effectiveness of over-the-counter or prescription medications?** Over-the-counter and prescription medications are generally very effective for the treatment of seasonal allergies, even for patients with severe symptoms. In particular, "newer" antihistamines effectively reduce nasal allergy symptoms but have minimal sedative properties.

**Finally, can people hope for a cure? Or will relief only come through proper prevention and careful treatment of symptoms?** Most patients can now obtain excellent symptom relief from allergic rhinitis, including complicating conditions, such as sinusitis and asthma. But further improvements will be possible with the development of new therapeutic approaches and a better understanding of the immune mechanisms that are responsible for allergic diseases. Since continued allergen exposure is necessary to induce symptoms, allergen avoidance is an attractive approach, and the NIAID-sponsored Inner City Asthma Study of children demonstrated that environmental interventions reduced wheezing in proportion to the reduction in allergens.

For more information on allergies and other infectious diseases, visit the National Institute of Allergy and Infectious Diseases at [www.niaid.nih.gov](http://www.niaid.nih.gov).

## MedlinePlus.gov Resources

Want to know more about allergic rhinitis? Check out the resources at [www.medlineplus.gov](http://www.medlineplus.gov). Do a search on “allergy” or use one of the following quick links:

National Institute of Allergy and Infectious Diseases: <http://www3.niaid.nih.gov>

Airborne Allergens: [http://www.niaid.nih.gov/publications/allergens/airborne\\_allergens.pdf](http://www.niaid.nih.gov/publications/allergens/airborne_allergens.pdf)

Allergy Clinical Trials: <http://clinicaltrials.gov/ct/gui/action/FindCondition?ui=D006967&recruiting=true>

Asthma and Allergy Resources: <http://www.niaid.nih.gov/factsheets/allergy.htm>

### Useful Publications

Fact sheets, symptom checklists, prevention tips and more are at <http://www.niaid.nih.gov/publications/allergies.htm>

“Ever since my first pregnancy, it seems I’m allergic to something all day, every day,” she says. “I cough a lot from the drainage, and it makes it hard to sleep. Over-the-counter medications don’t seem to work any more.”

### Testing for Allergies

When it comes to allergies, knowledge is power. Knowing exactly what you are allergic to can help determine the best way to lessen or prevent exposure and treat reactions when they occur. There are several tests that physicians use to pinpoint what you are allergic to. For example:

■ **Allergy skin test**—The most commonly used allergy skin test, known as a “prick test,” this diagnostic procedure involves pricking your skin with the extract of a specific allergen, then observing the skin’s reaction. Another test, the intradermal injection, introduces allergens just below the skin’s outer layers, is more sensitive than the prick test and is sometimes used when the prick test produces negative results. Allergy skin testing is considered the most sensitive testing method and provides rapid results. However, skin tests cannot be used when a patient suffers from certain skin conditions, such as eczema.

■ **RadioAllergoSorbent Test (RAST) and enzyme-linked immunosorbent blood tests**—The RAST and enzyme-linked immunosorbent tests are two blood tests that provide information similar to allergy skin testing, namely the levels of allergic (IgE) antibodies to allergens.

### Searching for Relief

For allergy sufferers, the best treatment is to avoid the offending allergens altogether. This may be possible if the irritant is a specific food, like peanuts, which can be cut out of the diet, but not when the very air we breathe is loaded with allergens. For example, a single ragweed plant can produce a million grains of pollen a day, and ragweed pollen has been found 400 miles out at sea and two miles high in the atmosphere.

Air purifiers, filters, humidifiers and conditioners provide varying degrees of

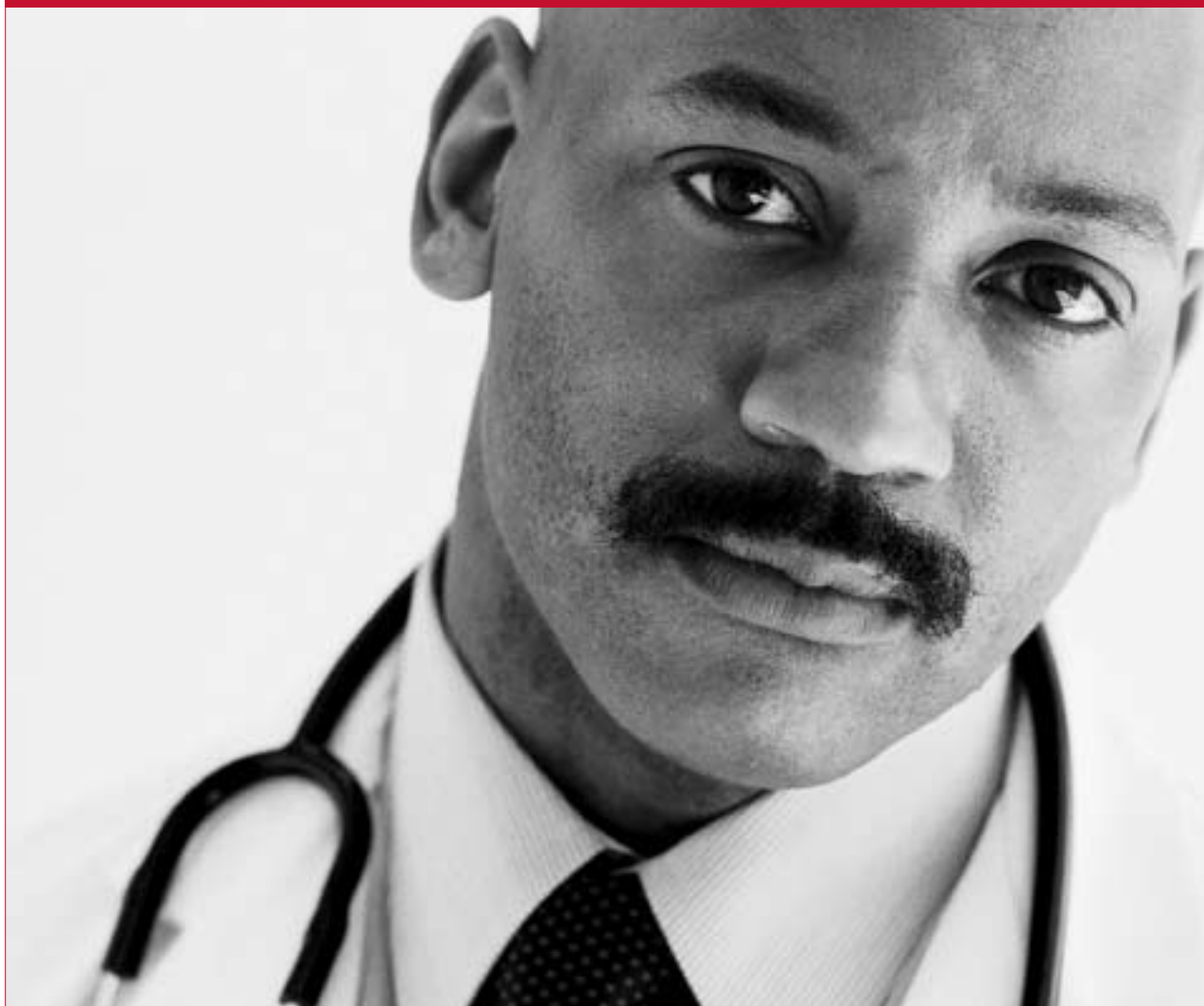
relief, but none is 100 percent effective. Normally, allergy sufferers look to various over-the-counter medications and physician-prescribed therapies. (See sidebar story, “Finding Relief from Allergy’s Grip,” page 21.)

### Hoping for a Cure

Relief may someday come in the form of an allergy vaccine, several of which are in development and show great promise. In one clinical trial, for instance, a series of six injections of a newly developed and specially formulated ragweed vaccine lessened symptoms and reduced the need for antihistamines among study participants. Perhaps more exciting is the fact that this particular vaccine seems to provide benefits for at least one additional year, without the need for booster shots.

For vaccines to be most effective, they must be specific. For someone allergic to ragweed, the new vaccine in development may be good news, but not to one who reacts only to grass pollen. Clearly, more research, development and testing are in order. While effective allergy vaccines are still years away from general release, research funded by NIH shows long-term promise. ■

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## Low Calorie Diet Affects Aging-Related Factors

Results from a controlled clinical trial indicate that overweight people who cut their calories by 25 percent for six months have reduced fasting insulin levels and core body temperature—two markers associated with increased longevity in humans. The study is part of a project sponsored by the NIH's National Institute on Aging (NIA) to learn more about the effects of sustained low-calorie diets in humans on factors affecting aging.

This type of intervention—maintaining a substantial percent reduction in caloric intake—has been shown to substantially extend the longevity of laboratory rodents if sustained over much of the animal's life span. Effects of such an intervention on human aging are not yet known.

The study, part of the NIA-supported Comprehensive Assessment of Long-Term Effects of Reducing Intake of Energy (CALERIE), was conducted by Leonie K. Heilbronn, Ph.D., Eric Ravussin, Ph.D., and colleagues at the Pennington Biomedical Research Center of Louisiana State University in Baton Rouge.

The low-calorie diet also resulted in changes in some, but not all, of the metabolic factors that have been related to longevity or aging. That study is a pilot project for a longer CALERIE trial expected to start in the autumn of 2006 at three U.S. locations to test effects of lowering caloric intake for two years.

## LactMed: New NLM Database on Drugs and Lactation

LactMed, a free online database with information on drugs and lactation, is one of the newest additions to the National Library of Medicine's TOXNET system, a Web-based collection of resources covering toxicology, chemical safety and environmental health. LactMed may be searched at <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT>.

Geared to the healthcare practitioner and nursing mother, LactMed contains over 450 drug records. It includes information such as maternal levels in breast milk, infant levels in blood, potential effects in breast-feeding infants and on lactation itself. The American Academy of Pediatrics' LactMed category indicates the level of compatibility of the drug with breast-feeding and alternate drugs to consider. As a work in progress, LactMed will continue to expand, with additional drugs and with other substances, such as industrial chemicals and radiation.



## Behavioral Therapy, Incentives Enhance Addiction Treatment

New research supported by the NIH's National Institute on Drug Abuse (NIDA) indicates that people who are trying to end their addiction to marijuana can benefit from a treatment program that combines motivational incentives with cognitive-behavioral therapy.

"Marijuana remains one of the most widely used drugs of abuse," says NIDA Director Nora D. Volkow, M.D. "Heavy use of the drug impairs a person's ability to form memories, recall events and shift attention from one thing to another." There also are significant lung and respiratory risks for regular smokers.

"The study results are largely positive, but there should be continued efforts to develop and evaluate effective treatments for marijuana addiction," Dr. Volkow adds.

## Genetics Experts Unite to I.D. Unknown Katrina Victims

A multi-institution team of experts, coordinated by geneticists from the NIH's National Human Genome Research Institute (NHGRI), is supporting efforts to identify more than 70 bodies in the aftermath of Hurricane Katrina.

"What we are discovering in the recent advances in molecular biology and genetics," says team member Stephen Sherry, Ph.D., of NLM's National Center for Biotechnology Information, "is that we have an unprecedented opportunity to identify people with precision and to affiliate them correctly with their families. This is a new aspect of science, and its impact is on everyone."

Katrina claimed more than 1,200 lives in Louisiana and Mississippi. More than 70 bodies remained unidentified.

## Breast Cancer and Estrogen-Alone Update

Estrogen-alone hormone therapy does not increase the risk of breast cancer in postmenopausal women, according to an updated analysis of the breast cancer findings of the Women's Health Initiative (WHI) Estrogen-Alone Trial.

The results contrast with the previously reported WHI Estrogen plus Progestin Trial, which found an increase in breast cancer over about 5 years among those taking combined hormone therapy. Over an average of about 7 years of follow-up, study participants taking estrogen had fewer breast cancer tumors than those in the placebo group.

"Longer follow-up is needed to fully explain the reduced number of breast cancers in women taking estrogen. However, this new analysis does not alter the overall conclusion from the WHI that hormones, including estrogen-alone and estrogen plus progestin, should not be used for the prevention of chronic disease," said NHLBI and WHI Director Elizabeth G. Nabel, M.D. "The findings still support current recommendations that hormone therapy should only be used to treat menopausal symptoms and should be used at the smallest effective dose for the shortest possible time."

### NIH Researchers Identify OCD Risk Gene

Scientists at the NIH's National Institute on Alcohol Abuse and Alcoholism (NIAAA) have identified a previously unknown gene variant that doubles an individual's risk for obsessive-compulsive disorder (OCD). The new functional variant, or allele, is a component of the serotonin transporter gene (SERT), site of action for the selective serotonin reuptake inhibitors (SSRIs) that are today's mainstay medications for OCD, other anxiety disorders and depression.

"Improved knowledge of SERT's role in OCD raises the possibility of improved screening, treatment and medications development for that disorder," said Ting-Kai Li, M.D., NIAAA Director. "It also provides an important clue to the neurobiologic basis of OCD and the compulsive behaviors often seen in other psychiatric diseases, including alcohol dependence."

Approximately 2 percent of U.S. adults (3.3 million people) have OCD, the fourth most prevalent mental health disorder in the United States. Individuals with OCD have intrusive, disturbing thoughts or images (obsessions) and perform rituals (compulsions) to prevent or banish those thoughts. Many other individuals demonstrate obsessive-compulsive behaviors that do not meet OCD diagnostic criteria but alter the individuals' lives.

### Cortex Matures Faster in Youths With Highest IQ

Youths with superior IQ are distinguished by how fast the thinking part of their brains thickens and thins as they grow up, researchers at the NIH's National Institute of Mental Health (NIMH) have discovered. Magnetic resonance imaging (MRI) scans showed that their brains' outer mantle, or cortex, thickens more rapidly during childhood, reaching its peak later than in their peers—perhaps reflecting a longer developmental window for high-level thinking circuitry. It also thins faster during the late teens, likely due to the withering of unused neural connections as the brain streamlines its operations.

"Studies of brains have taught us that people with higher IQs do not have larger brains," says NIH Director Elias A. Zerhouni, M.D. "Thanks to brain imaging technology, we can now see that the difference may be in the way the brain develops."



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- **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)**  
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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)  
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1-800-241-1055 (TTY)
- **National Institute of Dental and Craniofacial Research (NIDCR)** [www.nidcr.nih.gov](http://www.nidcr.nih.gov)
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- **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
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## Centers & Offices

- **National Library of Medicine (NLM)**  
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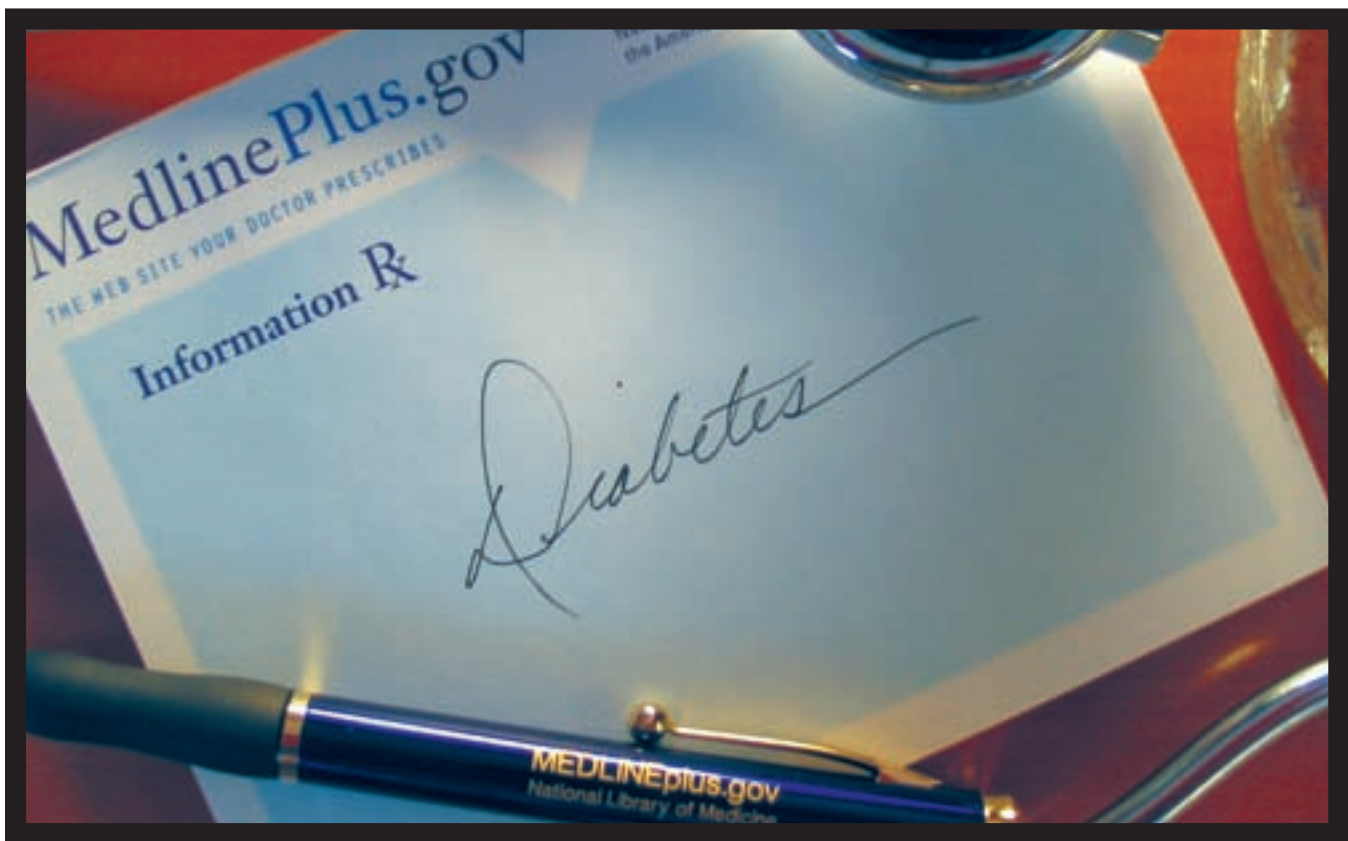
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